NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 3, NUMBER 28 SEPTEMBER 15, 1986

TOLL-FREE SERVICE

MCI breaks 800 barrier

Hits AT&T stronghold.

BY JOHN DIX
Senior Editor

WASHINGTON, D.C. — MCI Communications Corp. set to work dismantling AT&T's monopoly in the multibillion-dollar 800-service market last week with the introduction of MCI 800 Service, a competitive toll-free offering slated for early next year.

Although MCI 800 Service will offer attractive billing options and cost less than AT&T's service, analysts say it will be a plain-vanilla replica of its AT&T counterpart because MCI's network is technologically less sophisticated.

Toll-free 800-service is a particularly lucrative — and until now, noncompetitive — segment of the long-distance market. Analysts estimate the 800 market at $4 billion a year. In comparison, MCI's revenue is roughly $3.4 billion.

The way for MCI 800 Service was paved by recent regulatory approval of an Interim 800 Access Service tariff the Federal Communications Commission allowed the

See **800** page 6

TELEPHONE TURMOIL

ICA, consumers decry $3b BOC overcharges

Users back attack on telephone companies.

BY MICHAEL FAHEY
Staff Writer

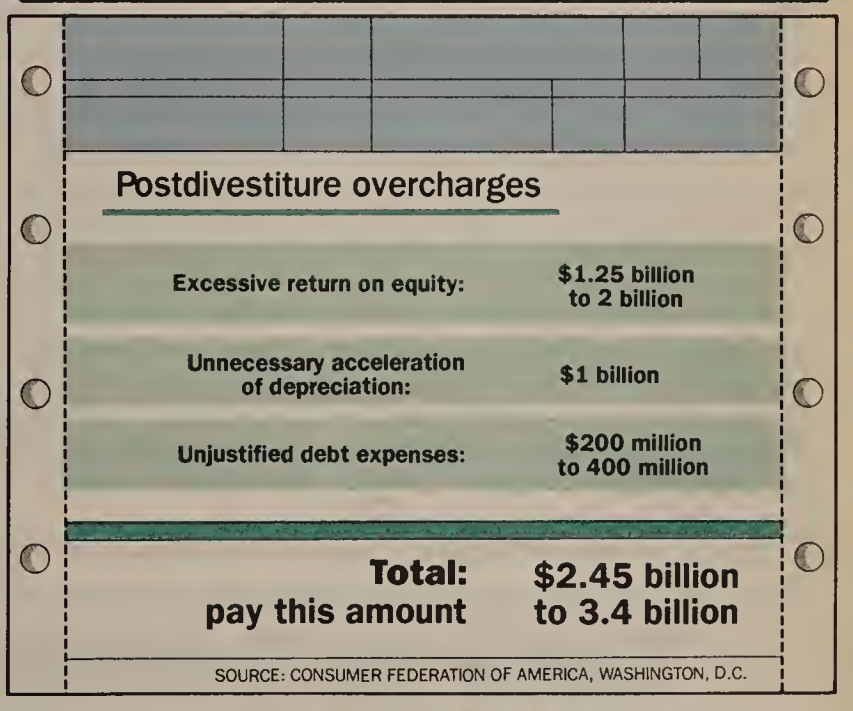
WASHINGTON, D.C. — Backed by the International Communications Association (ICA), the nation's largest consumer group assailed the regional Bell operating companies and their local subsidiaries last week for overcharging users by $3 billion and reaping "windfall profits" since the 1984 breakup of the Bell System.

The Consumer Federation of America (CFA), a coalition of 200 U.S. consumer organizations, issued a report that claims state and federal regulators have blessed the Bell companies with "unwarranted preferential treatment" since the divestiture of AT&T.

The CFA's report was endorsed by the ICA, which represents some of the larg-

See **Overcharges** page 44

How largest consumers group claims BOCs overbilled users



FEATURE FOCUS

Salty advice for T-1 shoppers

Don't get swamped by bad vendor advice.

BY BRIAN NESMITH
Special to Network World

Second in a two-part series.

You've done your homework. You've done a requirements analysis of existing facilities, attempted to anticipate future applications and decided which T-1 network architecture best suits your needs. Now it's time to buy a T-1 multiplexer.

Before knocking on vendors' doors, however, communications managers should prepare a list of mandatory criteria that can be used to eliminate multiplexers that are unable to satisfy their basic requirements.

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NETWORK MANAGEMENT

IBM courts T-1 aid to bolster Netview

Leading mux makers help to extend net control umbrella.

BY PAUL KORZENIOWSKI
Senior Editor

Network World has learned that IBM will soon shore up its T-1 multiplexer support by linking its recently unveiled Netview network management system with network management packages from some of the leading T-1 multiplexer makers.

Analysts said the companies most likely to be working with IBM to integrate their products with Netview include Network Equipment Technologies Co. (NET), Timeplex, Inc. and Datatel, Inc. Timeplex and Datatel offered no comment on any possible deals. NET officials could not be reached for comment by press time.

The announcement of T-1 support, which could come as early as this week, would be significant for two reasons. First, users have complained that IBM has done a poor job integrating T-1 facilities within its Systems Network Architecture network. The company's only T-1 support is an interface that ties a T-1 line to an IBM 3725 front-end processor.

That interface has been roundly criticized because efficient use of the interface requires a dedicated IBM 3725. Also, it is not possible to perform any network management or control functions over the link.

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NETWORK LINE

News

A Georgia court orders Holiday Inn/CSI to pay up in a ruling that could affect users that prematurely end an AT&T equipment contract. Page 4.

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Northern Telecom prepares to unveil a system for monitoring and controlling remote PBXs. Page 43.

▼

In a boost for Open Systems Interconnect, IBM establishes a research center in Rome for the development of OSI software. Page 44.

▼

Features

Product Focus looks at broadband local nets. Their extra capacity supports a myrlad of applications. However, users should beware of expensive add-ons. Page 32.

NEWSPAPER

▶ TCA '86

Little new, but plenty to review at TCA next week

Few debuts expected; big names turn out.

BY JOHN DIX
Senior Editor

SAN DIEGO, Calif. — Attendees of the Telecommunications Association's (TCA) 25th annual meet to be held here next week may uncover a few vendor surprises, but for the most part, the conference will be a show-and-tell forum for recently announced products and services.

The show, steeped in telephony history, will be kicked off by Richard E. Wiley, former chairman of the Federal Communications Commission and now a senior partner with the law firm of Wiley & Rein in Washington, D.C. Some 250 exhibitors are expected to participate in the show.

Traditional pillars of the event, switch makers and service providers, will be out in force at TCA. Switch manufacturers to exhibit include heavyweights AT&T, Northern Telecom, Inc., Rolm Corp., Mitel, Inc., Intecom, Inc., Siemens Information Systems, Inc. and Ericsson Information Systems, Inc.

Long-haul carriers will be represented by the top troika — AT&T, MCI Communications Corp. and US Sprint Communications Co. — as well as a few smaller carriers such as Lightnet, Argo Communications Corp. and Starnet Corp.

Perhaps the most important announcement slated for the show will be made by AT&T, which is expected to unveil its first matrix switch. The switch, called the Dataphone II Star Switch in an internal AT&T document ("AT&T to debut rumored switch at TCA," *Network World*, Aug. 18), reportedly will be manufactured by T-Bar, Inc., another show exhibitor.

Other show announcements will include a revamped customer support policy from Digital Communications Associates, Inc., makers of the popular 3270 emulation Irma card for IBM Personal Computers. The company will also unveil an enhanced network management system for its family of modems and communications processors.

US Sprint will conduct simultaneous press conferences, one at the show and another in Washington, D.C., to give a progress report on fiber-optic deployment in its nationwide network. Archcompetitor MCI will use the conference to showcase

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TOP NEWS

The head of Intelsat criticized the U.S.'s failings in the satellite launch field at last week's Satellite Communications Users Conference in Las Vegas. **Page 2.**

Major new product announcements are expected soon in the form of matrix switches from Bytex and new terminals and a T-1 mux from Lee Data. **Page 2.**

The word is that 3Com will take the wraps off a dedicated file server and announce enhancements and additions to its 3+ network software. **Page 43.**

INDUSTRY UPDATE

Good news at MCI of quarterly earnings just short of $1 billion is tempered by sobering news of depressed earnings and higher equal access expenses. **Page 9.**

TELECOM TRENDS

A California start-up company has designed a small-business telephone system powered by an IBM Personal Computer and running on a single twisted-pair wire bus. **Page 11.**

DATA DELIVERY

First users of Tangram's Arbiter, which provides micro-to-mainframe link capabilities, are impressed with the product but not ready to buy. **Page 17.**

FACTORY COMMUNICATIONS

IBM is coming up with all aces in its bid to make Personal Computers standard equipment on the factory floor. **Page 15.**

COMMUNICATIONS MANAGER

Todd Booth has organized a Token-Ring users group that links members through a giant E-mail network. **Page 21.**

NEW PRODUCTS AND SERVICES

Davox Corp. unveiled an automatic telephone calling system for credit collection agencies. **Page 27.**

FEATURES

Broadband local nets sport more applications than ever, with videoconferencing and factory automation on board. **Page 32.**

▶ INDUSTRY INSIDER

Product wave to break

BY PAUL KORZENIOWSKI
Senior Editor

Major new product announcements are on the horizon, *Network World* has learned.

Tomorrow, Bytex Corp., a matrix switch manufacturer in Southborough, Mass., is expected to unveil a new product line. The matrix switches reportedly will be based on a distributed architecture so they can be used with devices such as departmental processors. According to *Network World* sources, the new line will support as many as 1,024 ports, a dramatic increase over Bytex's current line, which boasts 300-port capabilities. One potential drawback is the lack of a migration path to the new products for current Bytex customers.

Later this month, Lee Data Corp. of Minneapolis is slated to add a number of new terminals to its line of IBM 3270-compatible devices. The company said it also plans to expand beyond its traditional terminal product line and offer a number of other networking products. Among them will be the company's first entrant in the T-1 multiplexer market.

▶ SATELLITE USERS MEET

Colino castigates feds

Intelsat chief claims launch woes worsen.

BY BOB WALLACE
Senior Writer

LAS VEGAS, Nev. — Richard Colino, director general and chief executive of the International Telecommunications Satellite Organization (Intelsat), last week lambasted the federal government for compounding current satellite launch woes.

Speaking to more than 200 users at the Satellite Communications Users Conference here, Colino said the destruction of four satellite launch vehicles, beginning with the explosion of the Space Shuttle Challenger in late January, has thrown the industry into turmoil. In the wake of the Challenger disaster, the Reagan administration has withdrawn the National Aeronautics and Space Administration from the commercial launch market and has encouraged private industry to pick up the slack.

"The U.S. space program is misguided," Colino asserted. "Under constant pressure to move the Space Shuttle ahead, the U.S. gave short shrift to the expendable launch vehicle program."

This inaction has opened the industry to foreign communications satellite launch groups, including France's Arianespace, that now make up 50% of the launch service market, Colino maintained.

"We look to the private sector in the U.S.; but without government help, launch costs will be out of sight," he predicted.

As an example, Colino claimed Federal Express Corp. will ultimately pay more than $50 million to Martin Marietta Corp. to deliver its communications satellite into geosynchronous orbit ("M. Marietta will launch," *Network World*, Sept. 8).

Intelsat is a 112-member-country international organization that owns and operates a global, commercial satellite communications system. One of Intelsat's satellites was destroyed along with a French Arianespace launch rocket earlier this year. Colino claimed the repeated failure of satellite launch vehicles has forced Intelsat to delay its satellite launch plans by at least two years.

Intelsat has already begun to explore the possibility of employing foreign launch facilities. "We find ourselves in an interesting era today, where we discuss with the Chinese using their Long March II for the launch of Series VI," Colino

See **Intelsat** page 42

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▶ LEGAL VIEW

Court orders user to pay AT&T termination costs

Precedent-setting case upholds validity of long-haul equipment lease pacts.

BY MARGIE SEMILOF
Senior Writer

SAVANNAH, Ga. — In what may be a precedent-setting decision, a state court here last week ordered a user company to pay equipment termination charges to AT&T Information Systems for prematurely ending its equipment lease contract.

The Superior Court of the state of Georgia ruled that Holiday Inn/CSI Associates, also based here, was liable for breach of contract for not paying termination charges after cutting short its contract with AT&T. The ruling, which reinforced the validity of the contract, may affect thousands of other AT&T customers who are considering severing long-term AT&T equipment leases.

Some users, consultants and attorneys have maintained that current AT&T Information Systems long-term lease contracts are not valid because they were originally drafted with local operating companies and were later transferred to AT&T after divestiture. Despite that contention, AT&T has demanded payment of the termination fee, which is a contract provision effective when a user attempts to terminate an AT&T lease contract. The court ruling clearly bolsters AT&T's position.

According to David Ritchie, general attorney for AT&T, his company was granted a partial summary judgment, which means the user must pay the charges, although the final amount of payment has not been determined. He said the fee may be as much as $8,600. Holiday Inn/CSI Associates plan to appeal the amount of the termination charge damage suit.

"The courts explicitly found that the contract was freely assignable and, therefore, validly assigned to AT&T Information Systems," Ritchie said.

"We've had claims made by attorneys and consultants representing various interests," Ritchie said. "First, they said AT&T wouldn't sue. Then they said AT&T wouldn't bring this to a summary judgment because they couldn't win. They cannot say that anymore."

"The [Holiday Inn/CSI Associates] decision constitutes a precedent," he added. "We will cite that decision, and I'm sure many courts will take a serious look at it."

Considering appeal

Bruce Saypol, attorney for Holiday Inn/CSI Associates, said, "The decision is incorrect, and we are considering our options on appeal. The judge just signed a proposed order given to him by AT&T," he continued.

"It is our opinion that the order does not deal with the issue in a meaningful way. "The judge took it upon himself to decide issues of fact that we feel should have gone to a jury."

Some users claim that AT&T has proven willing to negotiate the amount of the termination charges when customers plan to upgrade to AT&T equipment.

When those users attempt to eliminate AT&T as a vendor, however, AT&T reportedly takes a tougher approach in trying to collect the full amount of the termination charge. It was estimated that between 10% and 15% of AT&T customers currently have long-term lease contracts.

TCA from **page 2**

its new 800-service (see "MCI breaks 800 barrier," page 1), and display recently announced VAX Mailgate for MCI Mail, a product developed with Digital Equipment Corp. that integrates DEC's electronic mail system with MCI Mail.

Data communications vendors exhibiting at the show will include a spectrum of players, including Codex Corp., ComDesign, Inc., Dynatech Data Systems, General Datacom, Inc., Paradyne Corp., Racal-Milgo, Inc. and Sequel Data Communications, Inc.

These vendors are likely to be responsible for the bulk of new product launches at the show. Concord Data Systems, for example, said it will announce enhancements to its 224 Series of 2,400/1,200 bit/sec modems with support of MNP and X.PC error-correcting protocols. Codex, while not expected to introduce anything new, will display for the first time its 6216 mid-range, 16-channel, 56K bit/sec statistical multiplexer and spotlight its 6240 T-1 multiplexer.

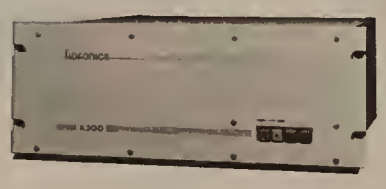
Surprisingly, only a handful of Bell holding companies or subsidiaries will make the conference.

Program topics at the show range from how-to seminars like "Establishing an In-House Training Program" and "How to Manage Problem Resolution," to management overviews such as "Basic Accounting for the Telecommunications Professional" and "How to Hire and Fire Consultants."

The conference runs from Sept. 22 to 27 and will be held in the Town & Country Hotel Convention Center here.

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Second-class postage paid at Framingham, MA, and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue the last two weeks in December by CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests.

Non-qualified subscribers: $3.00 a copy; U.S. — $95 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

Four weeks notice is required for change of address. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

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"ABC membership applied for" ABP

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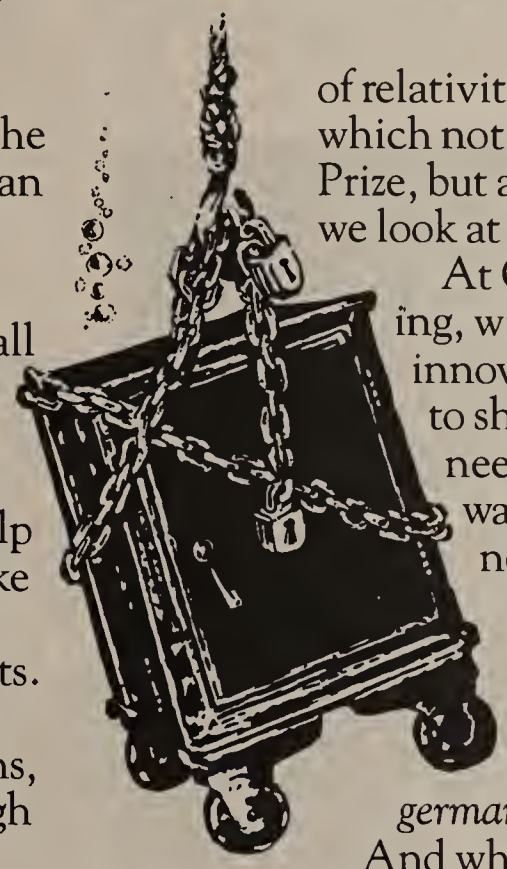
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▶ CORPORATE SCORECARD

IBM reorganizes units

BY PAUL KORZENIOWSKI
Senior Editor

WHITE PLAINS, N.Y. — With the breadth of its telecommunications product line increasing dramatically, IBM last week moved to streamline its operations by reorganizing two business units under the aegis of Communications Products Division President Terry R. Lautenbach.

The reorganization alters the responsibilities of two vice-presidents who report directly to Lautenbach. The duties of Lutz F. Hans have increased at the expense of those of Ellen Hancock, who heads up the Telecommunications Systems business unit.

Hans' Display Systems business unit was given charge of additional IBM product lines and renamed the Display and Telecommunications Subsystems business unit. In addition, personnel who reported to Hans may be moved from Kingston, N.Y., to Raleigh, N.C.

The Display and Telecommunications Subsystems unit will now be responsible for all product development for displays, display subsystem controllers, image scanners, protocol converters, local-area networks and gateways.

Previously, this group guided only display and display subsystem product development.

The Telecommunications Systems business unit will continue to be run by Hancock, but the group will now be responsible only for telecommunications access methods such as Vtam, network management systems such as Netview, front-end processsors, modems, Series/1 and System 88.

Hancock seems to be a loser in the reorganization. Some of her group's key responsibilities, such as IBM's local-area network projects, were taken away.

"IBM has had trouble delivering a lot of its communications products, and the Communications Products Division has not been making much money," said W. Chuck Kanupke, vice-president at Dataquest, Inc.'s Marlton, N.J., office.

Hancock was named IBM vice-president, an honorary title. She will now be on a functional par with Hans, who has not received that honor.

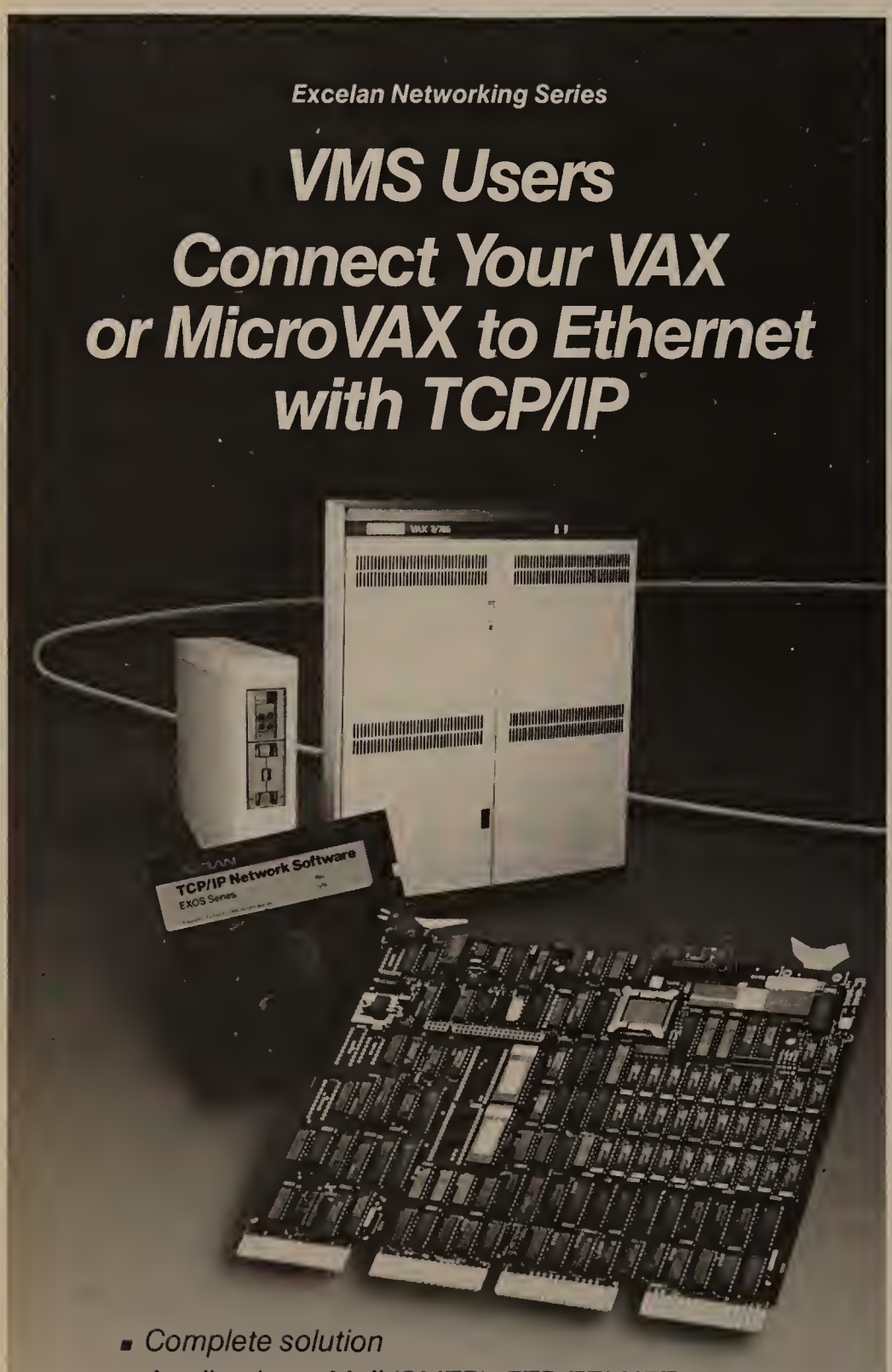
The reorganization appears to be a vote of confidence for Lunz, whose management style has reportedly impressed a number of analysts. "He is a real bottom-line guy who knows what it takes to make a profit," noted Ilene Goldman, an analyst at International Data Corp., a market research firm in Framingham, Mass.

IBM watchers said the move makes sense because display unit personnel are currently scattered in Raleigh, N.C., White Plains and Kingston facilities. Reportedly, the company was spending a good deal of money flying workers between the various locations for meetings. The decision to move the unit to Raleigh had been rumored for some time and did not catch employees by surprise, analysts said.

The reorganization may be the first in a series of moves that will stimulate attrition and enable IBM to trim its work force. Earlier this year, Chairman John F. Akers told security analysts that the company's work force would drop by the end of the year.

IBM said that 500 Display business unit workers would be affected by the move. The actual move will begin in the fourth quarter of this year and continue for 18 to 24 months.

It appears likely that a number of employees may choose to stay in Kingston either with another IBM business unit or with another employer.



800 from **page 1**

Bell operating companies to add to their books earlier this summer.

Under the interim plan, the BOCs will assign unused telephone exchange numbers to MCI and other carriers that want to offer 800 services. When the BOCs offer full equal access for 800-type services in late 1988, customers will be able to specify carriers and retain stylized 800 numbers, such as 1-800-BUY-CARS.

Until then, Roy Gamse, MCI's vice-president of marketing, said MCI will sell the new service on features such as virtual banding and the ability to provide detailed service bills. As with its Wats services, MCI will offer 800-service based on a flat, distance-sensitive rate, compared with AT&T's reliance on rate bands.

Virtual banding eliminates the need to dedicate trunks to particular geographic territories or bands.

The other major service difference, Gamse said, is the degree of billing detail MCI can provide. "We will provide full details of where calls originated, when they were made and how long they lasted."

Gamse said MCI's service would be less expensive than AT&T's, but he would not provide pricing details because the tariff has not been filed yet. He would not say if the tariff would be filed by the end of the year. He did say, however, that the company hopes to beta test MCI 800 with selected accounts later in the year and make it generally available by first-quarter 1987.

As planned, MCI's service will lack many of the enhanced features AT&T offers today, according to Joaquin Gonzalez, service director for enterprise network strategies with the Gartner Group, Inc., a Stamford, Conn.-based research firm.

AT&T's network uses Common Channel Signaling, where a computer network separate from the voice network is used to manage call establishment and routing. "This signaling method enables AT&T to route traffic depending on where it originated and the time of day," Gonzales said. "You can't do that if you don't have Common Channel Signaling."

Unable to compete with AT&T on an enhanced features basis, Gonzales predicts MCI will have to compete simply on price.

In the long term, however, MCI's prospects look good, according to Gerald Mayfield, president of the professional services division of the DMW Group, a consultancy in Stamford, Conn.

"This 800-service is a clear indication that MCI has made the transition from targeting consumer long-distance customers to focusing on business requirements," he added. That commitment, and new services like MCI 800, lead Mayfield to predict that "MCI will realize increasing success selling against AT&T."

▶ NCC-TELECOMMUNICATIONS '86

Users, sponsors mourn poor turnout

Vendors paced empty exhibit floors.

BY KARYL SCOTT
Washington, D.C. Correspondent

PHILADELPHIA — In the technical sessions and on the exhibition floor, the mood was funereal at last week's inaugural NCC-Telecommunications '86 show, which was marred by meager attendance and little new product activity.

The show's sponsor, the American Federation of Information Processing Societies (Afips), declined to divulge attendance figures for the show. Afips claimed there were 2,000 preregistered attendees, but organizers had hoped for between 10,000 and 15,000 attendees — a force that clearly did not materialize. To fill up the empty space at the Philadelphia Civic Center, vocational high school students and Bell of Pennsylvania employees were brought in.

On the show's first day, vendors were pacing the empty exhibit floor in search of potential customers. A salesman at the AT&T booth said late Monday he had talked to fewer than seven people all day. He questioned the wisdom of AT&T's decision to exhibit at the show.

Many vendors chose not to participate in anticipation of poor attendance. MCI Communications Corp. and US Sprint Communications Co. were among the major firms that chose not to attend. Even keynote speaker William McGowan, chairman of MCI, failed to draw the large crowd that Afips had hoped he would.

Day 2 boasted greater exhibit floor traffic, but attendance at conference sessions was spotty. A Tuesday afternoon session — a case study of a large user network installation — was canceled when only one attendee showed up. This was especially unsettling in light of the fact that conference organizers had billed the show as a user forum. Eighteen professional development seminars were canceled in advance of the show, owing to light preregistration.

Afips intended the show to be a regional event for users in the Eastern states to sample the latest in telecommunications technology. Despite its apparent failure, conference Chairman Carl Kleckner of Bell Atlantic Corp. said he hopes the show grows to national importance in the future.

"In light of the low attendance at NCC Las Vegas this year, Afips is trying to focus on narrower areas," he said. "We hope that we've established a foundation for future shows." When asked if NCC-Telecommunications would be held next year, Kleckner said it would, but a location had not been chosen.

The newness of the show and its limited promotion were thought to be the main reasons behind the poor attendance. The location, growing competition in the conference arena and limited corporate resources to attend shows were other contributing factors, according to attendees.

NCC-Telcommunications '86 seemed to lack a clear focus. As one attendee said, "Communications is the hot topic today, and if you can't attract people to a show in this area, something's wrong."

Kleckner said, "We're focusing on telecommunications as a strategic corporate resource. As corporations begin to use telecommunications more as a productivity tool and integrate it into the mainstream of business activities, demand for telecommunications information will increase."

It seemed the vendors didn't have a clear focus of the show's theme either. IBM was displaying local-area networks and host-based network solutions, while AT&T was showing its enhanced 800 service and PC teleconferencing services.

Many of the attendees seemed to be from MIS departments and were looking to learn about telecommunications. Stephen Fritts, a senior consultant with Genix Corp., the information services company for National Steel Corp., said he came to learn more about Integrated Services Digital Networks.

"It's a confusing concept, and no one seems to really know what's going on. I'm still confused and think most people here are as well," he said.

Barbara Wolfe, assistant vice-president for Information Systems at the University of Minnesota said she was hoping the show would provide a bridge between the data processing and telecommunications environments.

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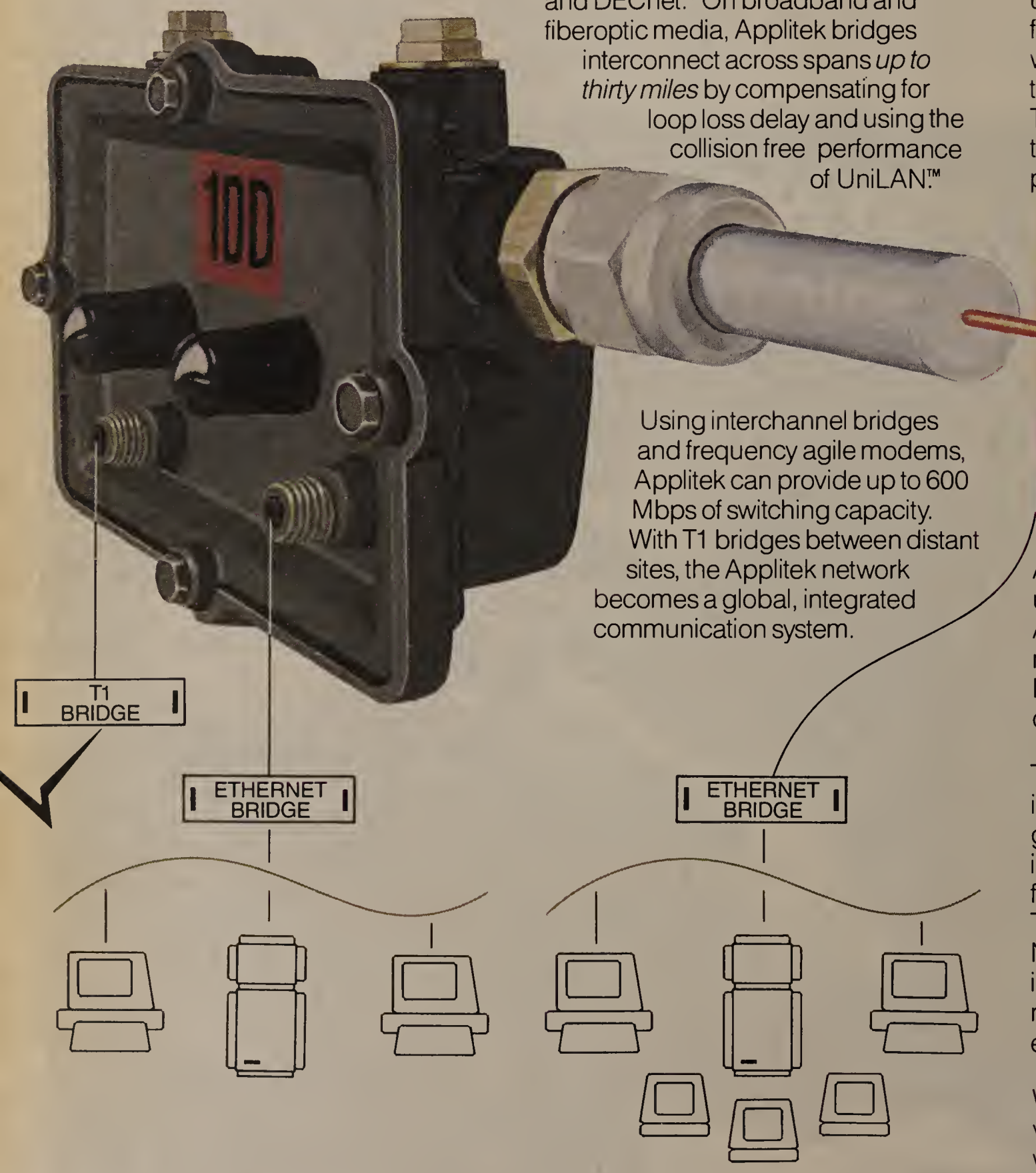
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INDUSTRY UPDATE

"Users indicate a dramatic increase in the usage of voice ports on their [time-division multiplexers] — increasing from an average ratio of 33/54 (voice/data) to 77/94 in the next two years. This suggests that many users are taking advantage of leftover T-1 capacity and filling it with voice.

The Multiplexer Market — 1986
The Market Information Center
Marlborough, Mass.

BALANCE SHEETS

MCI has mixed financial bag

Equal access expenses chomp into high revenue; network traffic up.

BY PAM POWERS
Senior Editor

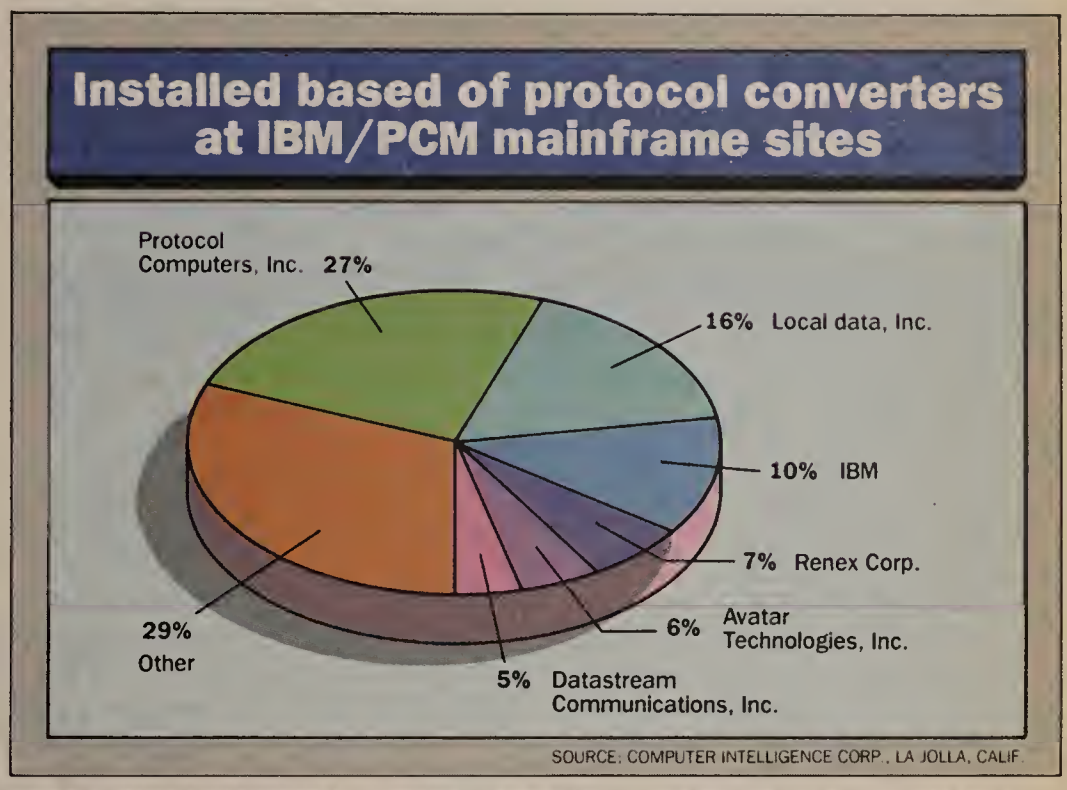
WASHINGTON, D.C. — MCI Communications Corp. came up just short of enjoying its first $1 billion quarter with the announcement last week of second quarter revenue of $942.5 million. But the good news was tempered by depressed earnings of $16.4 million, down from an estimated $17 million for the same period in 1985.

Equal access expenses and physical plant upgrades have conspired to eat away at MCI's profit margins. And despite continued customer growth, MCI anticipates that its recent price cuts will keep revenue growth flat for the coming quarter. Second quarter revenue was up $123 million from first quarter 1986 and up more than $341 million compared with the similar quarter last year.

In efforts to migrate its entire customer base to dial-1 status in equal access, local interconnection expenses increased by 2% of revenue over the first quarter. Almost 55% of MCI's customer base was converted to equal access by the end of the second quarter. The company expects to convert all but 10% to 15% of its customers by year end. The increase in equal access expenditures, while a drain on earnings, indicates an increase in traffic across the network.

The upgrade to equal access was more costly this quarter than last for two reasons. Premium access traffic growth was primarily residential. Residential traffic typically generates less revenue per dollar of equal access cost than does business traffic. In addition, the Federal Communications Commission increased access rates in order to

See **MCI** page 10



BOC CONTRACTS

Siemens will supply Ameritech CO switches

BY JIM BROWN
New Products Editor

CHICAGO — Siemens Communications Systems, Inc. has joined the ranks of digital central office switching systems suppliers for the five Ameritech Bell operating companies.

The U.S. subsidiary of the West Germany-based Siemens AG inked a three-year agreement last week with Ameritech Services, making Siemens Communications Systems one of three approved suppliers of digital central office switches for the operating companies.

The company will go head-to-head with AT&T and Northern Telecom, Inc. for a slice of the Ameritech pie. Ameritech BOCs will spend an estimated $150 million for between 35 and 50 digital central office switches in the coming year, according to an Ameritech Services spokeswoman.

Under the agreement, Ameritech Services approved Siemens as a supplier of its DE-3, DE-4 and DE-5 Digital Electronic Switching Systems to Ameritech's five operating companies: Illinois Bell, Indiana Bell, Michigan Bell, Ohio Bell and Wisconsin Bell. Siemens gained approval for inclusion in Ameritech Services equipment bidding procedures last July.

The agreement spells out the terms, conditions and prices for Siemens switches ordered this year for installation in Ameritech operating company local nets in 1988 and 1989. It will now be up to the five Ameritech operating companies to decide from which of the vendors they will order switches.

Earlier this year, Wisconsin Bell reportedly became the first BOC to order a Siemens digital switch under a separate agreement. That unit will be installed in Sheboygan Falls, Wis., next year.

MARK DAVIES

Users need the IP network solution

Frustration. There is no other word that describes as well the reaction of most communications managers to the explosion of workstations.

Transmitting data reliably from one host to another over a wide-area network has been fairly straightforward and cost-justifiable. Local premises communications is another matter. As personal computers, workstations and terminals from multiple vendors spring up throughout companies, users have struggled to manage and optimize these vital corporate resources. Compounding the problem is the need to interconnect local communications technologies with wide-area networks.

Seldom exceeding a radius of more than one mile, local networking solutions have evolved to address a variety of these communications problems: most notably cabling costs, terminal relocations and resource sharing. Given that these are the easiest to quantify, most local nets on the market today address problems at this level.

Users today clearly need a cost-effective solution that goes beyond the capabilities of existing technology. Just as in wide-area networking, the critical problem has been communications in the heterogeneous environment — among multiple hosts, workstations and devices from a wide variety of vendors. Users want to exchange information without concern for the vendor equipment or network technology involved. It is a need that goes beyond the limited radius of a local-area network.

While it is generally true that 80% of all data is transmitted within the local environment, the 20% that must pass over wide-area networks is often the most critical to business operations.

Crossing the boundaries from local- to wide-area networks involves two very separate technologies. It is the very nature of these technologies that makes it difficult to interconnect local- with wide-area networks.

Wide-area networks use connection-oriented media, such as X.25 and circuit switching, that allow users to establish and use logical connections. Most familiar is the voice telephone network where a user places a call and establishes a connection, transfers information through talking, and then releases the connection by hanging up. Ap-

See **IP** page 10

Davies is vice-president of wide-area networking for Codex Corp.

MCI from **page 9**
establish parity with the rate AT&T pays for equal access.

In addition to increased equal access expenses, MCI is being squeezed on the other side with its attempts to maintain competitive long-distance rates. On May 29, the company announced 10% reductions for MCI Wats and 9% for direct-dial long-distance services in reaction to even steeper rate cuts announced earlier in the year by AT&T.

The whipsaw effect of these converging forces is further exacerbated by the cost of expanding the company's network. In the past year, network improvement efforts cost the company more than $1 billion, an MCI spokesman said. A terrestrial microwave system of some 1,000 towers across the U.S. is in the final stages of completion. MCI continues to lay fiber nationwide and expects this effort to continue through the end of the decade.

The spokesman cited the company's acquisition of Satellite Business Systems (SBS) as playing a major role in the company's quarterly results. While bringing a $400 million company into the fold increased MCI's revenues, the spokesman said, "we would have been more profitable over a couple of quarters without SBS because the company was losing a lot of money when we acquired it."

MCI is in the process of migrating SBS to MCI facilities and reducing SBS' reliance on AT&T Wats services, used from SBS earth station hubs to cover the last mile to the customer. The process is an extended one that has decreased MCI's leased-line costs from about 20% of revenue last year to 8% of revenue this year.

Plagued by increasing costs

The telecommunications industry as a whole is plagued by increasing costs and competitive pricing. While MCI is saddled with burdens such as upgrading to equal access and the acquisition of SBS, even AT&T is looking a little anemic.

In fighting the battle, MCI has shifted its focus from the discounter to that of the service provider on a par with AT&T at every level.



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IP from **page 9**
plications that are well-suited to a connection-oriented approach are bulk file transfers, virtual terminal connections to host computers where security is a factor and access to distributed resources.

Local networks involve connectionless media that allow users to exchange information without establishing a connection. All of the information needed to send data from its source to its destination is contained in the data unit itself. Beyond having the capability to handle a large number of users, this media also provides broadcast functionality that allows a single piece of information to be disseminated among many destinations.

To accommodate both connection-oriented and connectionless media, a common and uniform information transfer service is required. Today that is being provided to a limited degree by the Department of Defense's Transmission Control Protocol/Internet Protocol and Xerox Corp.'s Xerox Network Systems protocols. Internationally, X.25 is accepted, along with popular proprietary protocols such as Systems Network Architecture and Decnet.

Addressing this need for a common protocol is the International Standards Organization with its development of the Internetwork Protocol (IP). This standard has already been endorsed by General Motors as well as the National Research Council for use by the Department of Defense.

The benefits of the IP are many: throughput enhancement, resource optimization, redundancy and resiliency. IP will operate only within those gateways, hosts and terminals that are directly attached to public-switched and private packet data networks, local nets and other subnetworks. No other equipment in either the local or wide-area network must be integrated, although benefits may result from other equipment directly supporting IP.

By viewing each subnetwork as a data pipe, IP integrates the service offered by each subnetwork into a uniform connectionless network service. Instead of allocating resources such as CPUs, buffers and data links for the duration of the connection, this service dynamically links the user on an as-needed basis.

Not only is this an extremely efficient method, when coupled with a deterministic or adaptive routing algorithm, network resources are optimized.

The advantage? Subnetworks are not affected by IP, and local traffic does not pay a price for the ability to internetwork with wide-area networks. Essential information is reliably transmitted, not only in the local environment, but through private and public data networks as well.

With the development of IP, it is time vendors began developing the set of products to allow users to obtain information in the heterogeneous environment seamlessly — whether the information is accessible locally or across a wide-area network.

TELECOM TRENDS

Name that transmission technology

So you thought you were up on transmission technologies. Have you heard of meteor burst communications? GTE Corp.'s research and development lab has successfully transmitted digitized voice signals over the trail of an incoming meteor. The test, which linked two facilities 150 miles away, proved the feasibility of the technology, which GTE anticipates will play a role in future military applications.

Key system market growth

Compound annual growth rate of stations shipped

Market segment	1984 Actual: Amount shipped	1984 Actual: Dollar value (in millions)	1990 Projected: Amount shipped	1990 Projected: Dollar value (in millions)	Compound annual growth rate
AT&T 1A2-Type	443.3	132.9	128	38.4	-18.7
Electronic key systems	2,982.2	894.7	3,371.6	1,011.5	2.1
Hybrid systems	604.5	181.3	768.2	230.5	4.5
Total	**4,030**	**1,209**	**4,267.8**	**1,280.4**	**1**

Compound annual growth rate of stations installed

Market segment	1984 Actual: Number of installed base	1984 Actual: Dollar value (in millions)	1990 Projected: Number of installed base	1990 Projected: Dollar value (in millions)	Percent change
AT&T 1A2-Type	16,710.8	4,177.7	7,464.5	1,866.1	-12.6
Electronic key systems	8,912.4	2,228.1	14,928.9	3,732.2	8.9
Hybrid systems	2,228.1	557	7,464.5	1,866.1	22.3
Total	**27,851.3**	**6,962.8**	**29,857.9**	**7,464.4**	**1.2**

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

▶ H&K COMMUNICATIONS

PC-powered phone debuts

Vnet system uses shared wire bus.

BY JOHN DIX
Senior Editor

MOUNTAIN VIEW, Calif. — A start-up company here has designed a small-business telephone system that is powered by an IBM Personal Computer and can support up to 60 phone sets on a single twisted-pair wire bus.

Vnet, developed by H&K Communications, Inc., a two-year-old company headquartered here, is one of the first personal computer-based telephone systems. It is also one of the only systems to support telephones on a shared wire bus. Vnet can be software-configured as a key system, hybrid key system or private branch exchange.

The Vnet system comprises a

See **Vnet** page 14

▶ SATELLITE EQUIPMENT

Voice of America replaces broadcast net

Comsat awarded five-year, $8 million contract to design, install new system.

BY NADINE WANDZILAK
Staff Writer

WASHINGTON, D.C. — Voice of America (VOA) is implementing a satellite-based radio broadcast network to supplant its expensive leased satellite circuits and obsolete equipment.

VOA's parent agency, the United States Information Agency, recently awarded Communications Satellite Corp. (Comsat) a five-year, $8 million contract to design and install the network, according to Robert Frese, VOA's chief of engineering.

The network, dubbed the VOA Satellite Interconnect System, is part of a $1.3 billion modernization program that was kicked off in the early 1980s.

The VOA distributes its program broadcasts from Washington, D.C. to 12 relay stations overseas, which then broadcast to local audiences in 42 different languages around the clock. Many of these stations are broadcasting many different programs simultaneously on different transmitters.

The satellite distribution network, which will include four new earth stations in the U.S., will replace the high-frequency radio equipment used by VOA. This effort will enable VOA to reach its overseas broadcast stations and enhance the quality of the signals those stations can transmit.

> *"Leased circuits would have cost about $20 million more a year."*

Under contract options, Comsat could also end up supplying two additional earth stations in the U.S. and up to 16 new relay stations around the world, bringing the contract total to $33 million. Comsat International Communications, Inc., a Comsat subsidiary, will provide the international communications links.

The cost of the new satellite system will be lower than what the agency is now spending for leased circuits.

"If we had proceeded to meet our long-term requirements solely with leased circuits, it would have cost about $20 million more a year than

See **VOA** page 14

CROSS TALK
JOHN DIX

Equal access: AT&T can't win for losing

Although AT&T came away from the equal-access polls an apparent winner, the company was, in fact, the only loser in the multibillion dollar customer shuffle.

Roughly 75% of the customers who were asked to pick a primary long-haul carrier stayed with AT&T. MCI Communications Corp. picked up roughly 10% of the dial-1 customers, US Sprint Communications Co. garnered 4%, and others divvied up the remaining 1% share of the pie.

But MCI, US Sprint and others didn't pull this market share out of U.S. District Court Judge Harold Greene's hat; they took it from AT&T. With few exceptions, each customer the other common carriers gained resulted in an AT&T loss. The only prize AT&T took home was a chance to continue to do business with a smaller customer base. Forced to play Russian roulette, AT&T won because it only shot its ear off.

Although they gained new customers, the MCIs and US Sprints came out of the multimillion dollar marketing melee with mud on their faces. They failed to capitalize on this once-in-a-lifetime golden pig poke.

Looking back, the whole thing would be comical if the stakes weren't so enormous. After fighting for years for a chance to eke out a living, suddenly MCI and the others that followed in its footsteps were thrown into the behemoth's fish bowl and told they could keep what they could grab.

The prospects looked astounding. The other common carriers were piranhas. And AT&T was sluggish from a century of monopoly protection and had everything to lose.

And lose it did. But it did not lose to the degree that everyone had expected, hence the tendency to label the loss a victory.

Fat as it was, AT&T proved too nimble for the newcomers, who never found a way to focus their marketing on individual areas as they were cut over to equal access. Where they could mount an advertising blitz, AT&T's reputation often proved too much to overcome.

Depending upon your point of view, equal access produced all losers or all winners. The everyone-lost scenario can be justified by the fact that AT&T customers defected, and the other carriers failed to persuade more to do the same. Or, everyone won because AT&T maintained its market dominance, and the other carriers gained new customers.

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4. And for users who need voice and data communications, plus access to data bases both inside and outside of the company, we offer a digital switch, the ROLM CBX II.

By the way, these four complement each other and can be interconnected.

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▶ LONG DISTANCE

Tel/Man, Southernnet announce joint merger

Traffic ending on fiber-optic net expected to give new company a financial boost.

BY PAM POWERS
Senior Editor

GREENVILLE, S.C. — In yet another example of consolidation in the turbulent long-distance market, Tel/Man, Inc., a long-distance reseller, recently announced its intent to merge with Southernnet, Inc. of Atlanta, Ga.

Tel/Man, which resells long-distance services between North Carolina, South Carolina and Augusta, Ga., had mid-year 1986 revenues of $20.6 million.

While traditionally serving primarily voice applications, the company is now making an effort to serve data transmission applications as well.

Southernnet was also once predominately a long-distance reseller, but, according to Charles Houser, president and chief executive officer of Tel/Man, "Southernnet is in the midst of completing its own fiber-optics facilities."

Tel/Man has traditionally leased about 25% of its facilities from Southernnet. With the completion of the fiber backbone, Houser expects that about 50% of the revenues generated for the merged companies will come from traffic terminating on the fiber-optic network.

Southernnet suffered losses of $6 million in 1985. The company anticipates better financial performance in 1987 with the completion of the network.

Tel/Man, which had earnings of $1.6 million on revenue of $26.7 million in 1985, expects to strengthen its position as a services provider by offering voice and data transmission over fiber optics. Houser says Tel/Man customers will migrate to the network as soon as possible.

Completion of the merger is contingent upon approval by stockholders of both companies and other conditions.

No name has yet been given to the new company.

Vnet from **page 11**

modified IBM Personal Computer and proprietary Vnet telephone sets, according to Gary Miller, H&K's director of marketing.

The micro terminates telephone company trunks and controls communications across the twisted-pair wire bus, which may be existing twisted-pair telephone wire.

Vnet telephones are tapped into the bus using RJ11 Y cable splitters located anywhere along the cable's maximum 10,000-foot length. The single wire pair is shared through use of frequency division multiplexing, which provides 20 full-duplex communications channels.

Abiding by traditional PBX design conventions, these 20 channels can support roughly 60 telephones, Miller said. In applications with light telephone use, the system is capable of supporting up to 200 sets.

Each Vnet telephone contains a frequency division multiplexer, which can access any of the 20 channels, and a digital modem for sending and receiving command signals over a separate frequency to the personal computer controller.

> *"Miller estimated that Vnet would cost half as much installed as AT&T's Merlin."*

When a caller dials another extension, the Vnet telephone sends the digits to the controller over the data channel, which hunts for an unused analog voice channel and instructs both telephones to tune to that frequency. After establishing the link, the controller bows out of the conversation.

Miller likened the tuning operation to setting two citizen band radios to the same frequency. When dialing an outside number, the personal computer follows the same procedures to connect the calling telephone with an outside trunk.

Because the controller is only used to establish and tear down calls, instead of switching them through an internal switch matrix, Vnet can be expanded without adding capacity to the personal computer.

The Vnet system is expanded by adding new RJ11 wire splitters and Vnet telephones, Miller said. Expansion with most key systems and PBXs involves adding new cable, new telephones and new line interface cards.

Miller claims that Vnet technology reduces system costs dramatically. Although he would not quote firm retail prices because the product will be sold through OEMs, Miller estimated that Vnet would cost half as much installed as AT&T's Merlin. He said that even greater savings would be realized with system growth.

Besides cost and simplicity of installation, Vnet offers some other inherent benefits. Vnet telephones, which Miller described as being half the size of a standard 2500 set, have 36 buttons and a two-line, 16 character LCD display.

The display can be used to display electronic messages. Miller said a receptionist can use the controller as a console to create and distribute electronic messages. Once alerted to the messages by a signal on the Vnet set, users can scroll through them by date, time or phone number. Calls can then be returned by hitting a single button, which pulls the number out of the message and dials it.

The remaining Vnet buttons can be software-configured to mimic the functions of other telephone systems for familiarity, or they can simply be set up to provide one-button access to normally cumbersome hook-flash functions such as call forwarding.

Miller dismisses criticism of personal computer reliability as being not great enough for telephony by blaming most computer failure on programs and inept users.

"By dedicating the personal computer to running phones, we eliminate 99% of micro reliability problems," he said. Addition of an uninterrupted power supply provides extra protection.

H&K Communications is said to be looking for OEMs to market the product. The company is located at Suite 414, 1101 San Antonio Road, Mountain View, Calif. 94043.

VOA from **page 11**

this satellite distribution system," Frese said.

The broadcast agency will also gain network control from the new system's two-way communications capabilities. Today's broadcast feeds are one way to remote stations, and communications back to Washington, D.C. is by telephone or teletype. The two-way capability will enable the agency to detect transmitter malfunctions in real time and reroute broadcasts by redirecting satellite antennas.

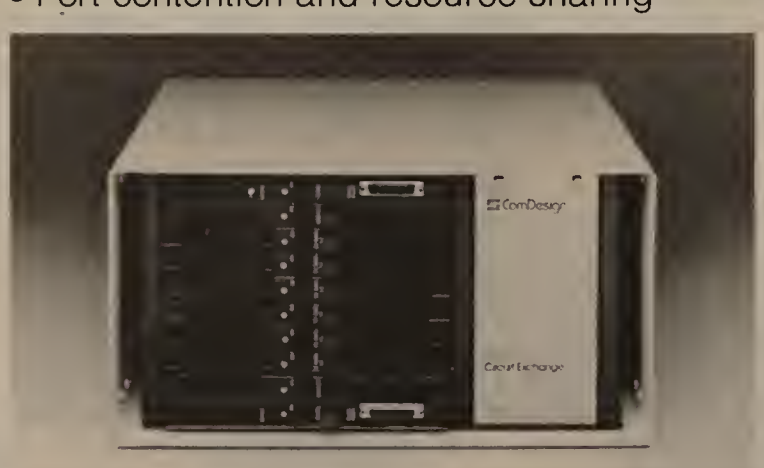
The all-digital satellite net will also provide internal communications among the four U.S.-based earth stations. Those stations will be located in North Carolina and Ohio, with two in California.

The equipment will initially be installed in Washington, D.C. and then phased in at worldwide VOA facilities over the next five years.

"Field technicians have done a magnificent job of maintaining the obsolete equipment we have," Frese said.

As an extreme example of obsolescence, he cited two transmitters in operation in Germany that were captured from the Nazis at the end of World War II.

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FACTORY COMMUNICATIONS

Retix signs OEM pact

Santa Monica, Calif.-based Retix last week licensed its full suite of Open Systems Interconnect/Manufacturing Automation Protocol software to Intergraph Corp. of Huntsville, Ala. The deal allows Intergraph, a graphics equipment manufacturer, to port the Retix protocols to all of its products. The communications software covers the logical link control sublayer through the session layer of the OSI/MAP/Technical and Office Protocol architecture.

ANALYSIS

IBM PCs find home on factory floor

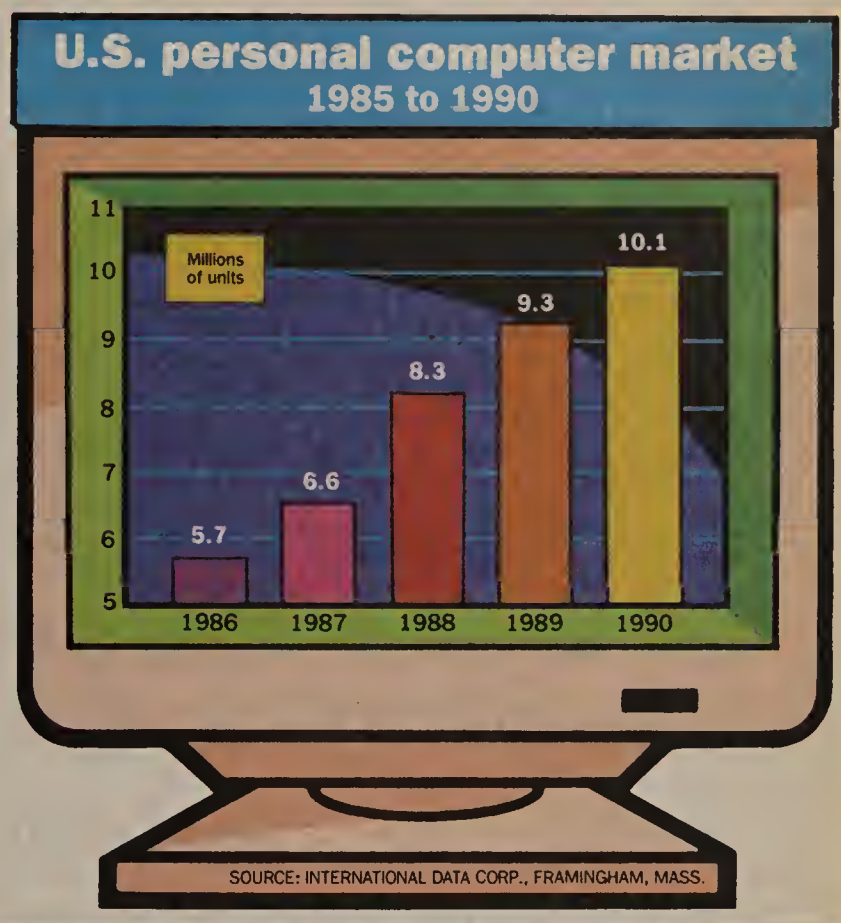
IBM, INI announcement will spur wider use.

BY BOB WALLACE
Senior Writer

The IBM Personal Computer is fast becoming the microcomputer of choice on the factory floors of the nation's largest manufacturing companies. IBM and Industrial Networking, Inc.'s (INI) recent joint announcement of an interface that links IBM Personal Computer ATs and Personal Computer XTs to broadband, Manufacturing Automation Protocol-compatible local nets was IBM's second major effort in the past year to promote use of its industry-standard micros in manufacturing.

In mid-April, IBM joined forces with Ford Motor Co. to develop an interface that would enable the country's No. 2 automaker to run IBM's PC Network over the same coaxial cable that may eventually support a MAP local-area network. Broadband, coaxial cable-based nets enable users to run multiple networks over a single cable simultaneously. One network, for example, would use a certain radio frequency range,

See **PC** page 16



FACTORY FACTS
BOB WALLACE

Time and the factory wait for no one

If the saying "He who hesitates is lost," applies to factory networking, someone had better throw AT&T a road map. AT&T's chief computer equipment nemesis, IBM, has easily passed through the window of opportunity in terms of developing factory networking gear. However AT&T, it appears, will smash through this same window of opportunity once it is closed.

Case in point: IBM and its joint product development partner, Industrial Networking, Inc. (INI), announce the availability of factory-floor equipment reportedly compatible with the Manufacturing Automation Protocol. The key product in the announcement is the MP-500, which comprises a two-board interface that enables factory networkers to link IBM Personal Computer ATs and XTs to MAP-compatible nets.

In reaction to the announcement, AT&T claims that the same interface equipment can be used in its PC 6300 and PC 6300 Plus industrial workstations. However, there still remains some question as to how difficult this will be.

AT&T seems to be lacking one major interface needed to help its workstations find a home on the factory floor. This vital link would tie the workstations to mid-range proprietary local nets (or factory subnetworks). Programmable logic controllers — devices that control the operation of robots, conveyors, computerized numerical controllers and other equipment — are frequently linked to these proprietary local-area nets. Without the proprietary local net-to-workstation link, the worth of the workstations is diminished.

IBM, however, has the key interface. It is known as A Real-time Interface Coprocessor (Artic) card and allows proprietary programmable controller local nets such as Allen Bradley's Data Highway to be linked through its personal computer to the backbone factory net.

> *"IBM has the key interface — the Artic card."*

Anthony Friscia, managing partner of the Chicago-based Advanced Manufacturing Research consulting firm, explained the value of the Artic link. "IBM has the Artic card, which enables factory networkers to connect programmable controller nets such as Data Highway, [Texas Instruments, Inc.'s] TIWay and [General Electric Co.'s] GENet to the IBM Personal Computers," he explained. "The [MP-500] allows these nets to hook to a MAP net via the personal computer.

"The interface is the key," Friscia claimed. "Without this link, the AT&T workstations will only be used for general-purpose factory-floor applications." The Personal Computer ATs and Personal Computer XTs, however, may soon be used to manage individual manufacturing cells, Friscia contended. The AT or XT may soon rival Digital Equipment Corp.'s MicroVAX as the popular cell controller of choice. "For smaller cells, the AT or XT may be an alternative to the more powerful and more expensive MicroVAX," Friscia noted.

With such a programmable logic controller-to-personal computer link, AT&T could greatly enhance the value of its recently announced industrial workstations. Without such a direct link, the PC 6300 and PC 6300 Plus may be relegated to spot use on the factory floors of the nation's manufacturing companies.

INCIDENTALS

Those wishing to attend the Autofact '86 show in Detroit should contact the Society of Manufacturing Engineers (SME) at (313) 271-0777. The conference, which will be held Nov. 11 to 14 at Cobo Hall, will focus on the challenges presented by Computer-Integrated Manufacturing (CIM).

Those factory networkers searching for comprehensive manufacturing networking seminars should check out four individual SME-sponsored courses that focus on various aspects of factory-floor networking. All four courses will be held at SME's World Headquarters in Dearborn, Mich. "Essentials of Data Communications for CIM," will be held Oct. 14 to 16 and will focus on networking trends. "Networking in a CIM Environment," to be held Nov. 18 to 20, is designed to provide factory networkers with an introduction to critical CIM issues, manufacturing data bases and communications requirements for CIM systems. "Planning and Project Control for the CIM Network," to be held Dec. 9 to 10, will discuss the CIM network design process and preliminary and detail design issues. "Supporting and Maintaining the CIM Network," which will be held Dec. 11 and 12, will focus on network control, network problem management and system administration. For additional information, contact SME at (313) 271-0039.

Integrated Computer Systems of Culver City, Calif., is offering a

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PC from **page 15**
while a second net would employ a bandwidth not dedicated to the first net.

The Ford/IBM project, currently under way in the automaker's Wayne, Mich., assembly plant, called for the creation of a prototype PC Network that would link 60 XTs to the plant's processors over a broadband factory-floor net.

Roger Zauel, systems and data processing manager for Ford's body and assembly division throughout most of the project, said if the effort is deemed successful, equipment used in the prototype PC Network would likely be installed in up to 25 other Ford plants.

If IBM's PC Network passes the test at the Wayne plant, IBM could pass through the open window of opportunity and reap the benefits of Personal Computer and PC Network sales to the manufacturing industry.

Market research shows there is still plenty of growth left in the personal computer market — growth that could be spurred by increased use of personal computers on the factory floor. International Data Corp. (IDC), a Framingham, Mass.-based market research firm, projected sales of all personal computers will climb substantially during the next five years.

The AT and XT MAP net interface gear IBM and INI debuted at the International Machine Tool Show in Chicago earlier this month should act as a catalyst for the sale of the ATs and XTs in the manufacturing world, according to Anthony Friscia, a managing partner with Chicago-based Advanced Manufacturing Research (AMR). AMR is an industrial automation and integration consulting firm. "The IBM PC is going to be very widely used in the factory," Friscia said.

The interface gear, available from either IBM or INI, comprises a controller board and a modem board, which are installed in an AT or XT. The two-board set, dubbed the MP-500, allows users to hook the micros directly to broadband networks compatible with MAP Version 2.1.

IBM, through its nine-month-old joint product development agreement with INI, has all the MAP interface equipment it needs to hook its Personal Computers as well as its line of industrial processors to MAP-compatible nets. It is impossible to determine if the agreement between INI and IBM will prohibit INI from, say, developing any equipment needed to link AT&T computers to MAP local nets.

Nonetheless, said Glenn Yeager, a manufacturing automation consultant with Ypsilanti, Mich.-based Integrated Automation Corp., AT&T will benefit from the IBM/INI moves.

IBM's Personal Computers use PC-DOS, IBM's version of Microsoft Corp.'s MS-DOS. AT&T's PC 6300 and PC 6300 Plus also run MS-DOS. Thus, an AT&T spokesman claimed that the INI MAP interface gear designed to link IBM computers to MAP nets can also be used to hook the AT&T PC 6300 and PC 6300 Plus to MAP nets.

If the INI boards can be used — without much additional work — to link the two AT&T workstations to MAP nets, don't be surprised to see AT&T sign some type of OEM agreement with INI in the next month.

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Incidentals from **page 15**
three-day, hands-on course entitled "MAP/TOP: Networking in Industrial Environments."

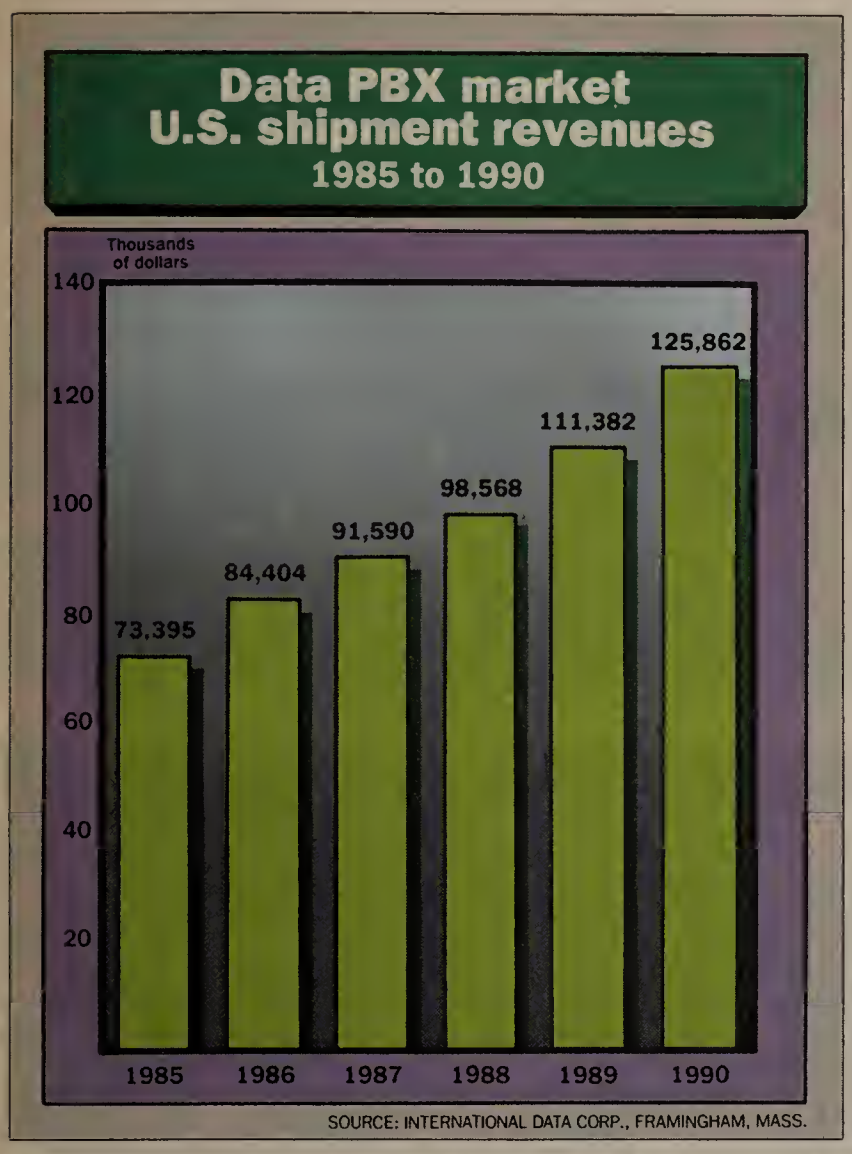
The mini-course, which costs $995, will be held on the following dates: Oct. 29 to 31, Los Angeles; Dec. 10 to 12, Washington, D.C.; Jan. 14 to 16, San Diego; Jan. 28 to 30, Ottawa; Feb. 11 to 13, Washington, D.C.; March 4 to 6, Anaheim, Calif.; March 11 to 13, Boston; March 25 to 27, Palo Alto, Calif.; and April 1 to 3, Washington, D.C.

For additional information, contact Integrated Computer Systems at (800) 421-8166.

DATA DELIVERY

ATM maker up for grabs?

A.O. Smith Data Systems, Inc., a leading manufacturer of Automatic Teller Machine software in Milwaukee, Wis., may be on the block. Merrill Lynch Capital Markets Group has been authorized to determine the future of the company, which is a subsidiary of diversified manufacturer A.O. Smith Corp. Thomas I. Dolan, A.O. Smith Data Systems chairman, said that the company may grow and prosper to a greater extent under the ownership of or in association with a financial firm.



MICRO TO MAINFRAME

First Arbiter users happy but hesitant

Strengths of Tangram link include efficient host resource use and speedy file transfers.

BY PAUL KORZENIOWSKI
Senior Editor

Beta users of Tangram Systems Corp.'s Arbiter are impressed with its microcomputer-to-mainframe link capabilities but are struggling with the decision of whether to implement the product on a wider scale.

Arbiter, introduced in June, consists of two software packages. One runs on an IBM Personal Computer, and the other runs as a Vtam application on an IBM MVS mainframe. The product performs data extraction and formatting functions so personal computer users can work with mainframe data. Arbiter works with a number of terminal emulation file transfer boards such as those in Digital Communications Associates, Inc.'s (DCA) Irma line.

James Purdy, director of system development and support at Revlon, Inc. in Edison, N.J., was impressed with Arbiter's efficient use of host CPU time. His company conducted benchmark tests and found that the product required 50% less mainframe resources than Micro Tempus, Inc.'s Tempus-Link, which Revlon had been using for more than one year.

The tests were not conducted because the company was dissatisfied with Tempus-Link. "We always examine new products to see if we can operate more efficiently," Purdy said.

One of Arbiter's enticing capabilities is the way the product was designed.

See **Arbiter** page 18

MARKET INSIGHTS

Communications key to IBM's future prosperity

Must shift tack to meet financial goals.

BY NADINE WANDZILAK
Staff Writer

Faced with slowing mainframe growth and radical changes in the industry, IBM is looking beyond computers for additional revenue sources to reach its ambitious goals.

The Armonk Goliath has told everyone that it aims to grow at least 15% per year and attain revenue of $145 billion in 1990 and $185 billion by 1994. To reach those goals, IBM is shifting its target to the ground between computers and telephones — data communications. IBM must quickly enter the telecommunications arena and establish a solid presence in the merging communications market to achieve its revenue objectives.

These conclusions are drawn by Frost & Sullivan of New York in a 10-year strategic analysis of the industry giant. The 376-page study profiles IBM strategic product lines and those of two dozen Big Blue competitors. The IBM portrait includes strategies and tactics in some 10 areas, including pricing, distribution and administration and organizational management. The study ranks the top players in several product categories, such as mainframes, minicomputers and microcomputers.

IBM entered the computer business in 1944 with the Mark 1, its first large computer. The company introduced its personal computer in 1981, after missing the minicomputer market boom. IBM's microcomputers have set the industry standard since they were introduced, and they have supplied the company with a great deal of sales impetus, the report states.

To stay on top, IBM must steer the microcomputer market back to the mainframe environment. The industry has changed, and IBM must also change. Users today are demanding that their software and hardware be integrated into cohesive systems, according to Frost and Sullivan, and those systems joined into networks. So, IBM must first be both a supplier of total solutions for its clients and the controller of the communications seg-

See **IBM** page 18

DATA DIALOGUE

PAUL KORZENIOWSKI

Ending incompatibility is a COS impossibility

The Corporation for Open Systems (COS) appears to be the computer industry's analogy to motherhood. Everyone is enthusiastically endorsing it, even though no one seems to understand completely what COS is.

Consequently, the organization is being billed as a cure-all for the incompatibility diseases that currently ail most users. Once the organization has established its conformance testing suites, incompatibility problems will disappear. Advocates say that users will be able to take any COS-endorsed product, plug it in with any other piece of equipment and the two will work together. That situation has never occurred and will never occur in the communications industry.

Take something as simple as an RS-232 connection. A few months ago, a coworker asked me if he could borrow my printer. I went to his house with my printer and the cable that connects it to my microcomputer. The plug for my machine would not fit his personal computer. A different cable was needed even though both devices used an RS-232 connection.

RS-232 is one of industry's older, more stable standards. Recently, there has been a lot of discussion about making some significant changes to the standards — changes that could make connecting RS-232 devices even more difficult.

The industry abounds with other examples of nonstandard standards. Digital Equipment Corp., a principal standards advocate, uses four types of Ethernet connections for its Decnet networks.

These two examples present simple problems when compared with the work that COS is undertaking. The problem of connecting different types of equipment on one network is not new. The U.S. government has been wrestling with it for

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Arbiter from **page 17**

Arbiter works as a Vtam subsystem, such as TSO or CICS. This capability enables the link to access mainframe data directly. Other link offerings access the data through TSO or CICS, which increases the operating overhead. The feature also provides a user more flexibility when working with various types of files, according to Purdy.

He listed a number of other benefits such as the product's menu-driven interface, the limited number of steps needed to complete a link and swift file transfers.

Revlon has used DCA's Irma board with Arbiter. The company is awaiting a version of the product that supports boards from Micro Plus, Inc.

Even though Purdy was impressed with Arbiter, he is not certain whether Revlon will purchase the product. Only a small number of workers, approximately 10, currently use a microcomputer-to-mainframe link. Typically, they are salesmen who download information for analysis work. Because the number is so small, the company cannot cost-justify replacing Tempus-Link with Arbiter. Purdy is attempting to justify Arbiter on the basis of the expected number of new link users. He is not sure when the cost-justification process will be completed or whether the company will actually decide to purchase the new product.

The University of North Carolina at Chapel Hill has narrowed the choices for its next link to Arbiter and Tempus-Link. Donald Mitchell, associate director of the computing center at the university, said the university has worked with a number of public domain file transfer packages, such as Kermit, and found them lacking in features and functions.

Mitchell's group has been searching for a new package to recommend to the 3,000 students and university officials with microcomputers. He maintained there are pluses and minuses to both link products.

On the plus side, Tempus-Link is an older, more established product, so any bugs with the initial release have already been worked out. On the minus side, it appears to eat up a lot of CPU cycles.

Arbiter works with newer technology and handles items such as file transfers more cleanly than Tempus-Link, Mitchell said. Since Arbiter is new, it does not yet support a wide range of other vendors' products. The university would like to use the product with IBM's 7171 protocol converter, but Arbiter currently does not support the IBM offering.

An important selection criterion is compatibility with the university's existing security package, IBM's Resource Access Control Facility. "We want to make sure that only authorized people have access to our mainframes," Mitchell said. Both Arbiter and Tempus-Link work with the IBM product.

Security is a key feature at The Federal Reserve Bank in Chicago. The bank has been reluctant to supply its users with microcomputer-to-mainframe links, owing to security shortcomings with existing link offerings.

David Bell, systems analyst at the bank, has a threefold interest in Arbiter. First, the product functions efficiently as a Vtam subsystem. Second, Arbiter supports IBM PC-DOS commands. Last, the bank wanted to store its personal computer data on a host system.

There is, however, one significant shortcoming with the product, Bell said. The bank wants a package that works with its existing security package, SKK, Inc.'s ACF2. That feature is not presently bavailable with Arbiter. Tangram has said that it will soon be available. The bank plans to make a purchase decision in six to eight weeks.

IBM from **page 17**

ment of the information system.

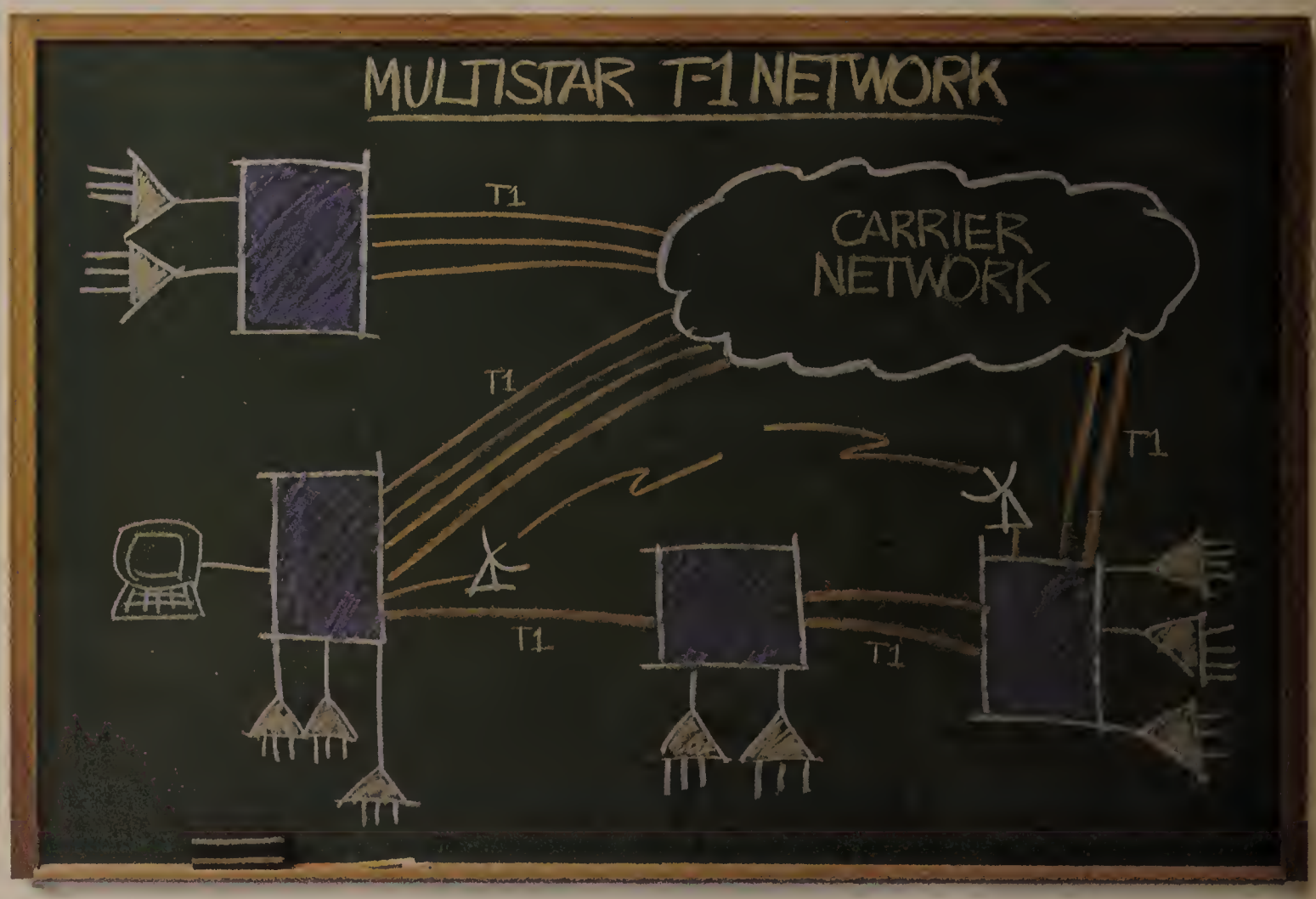
The goal underlying all IBM strategies, according to Frost & Sullivan, is connectivity, from workstation to work group to network to central data base ideally controlled by IBM mainframes. The report repeated an earlier Frost & Sullivan prediction that by the 1990s, IBM will generate an integrated architecture that will encompass multiple product lines, tying them back to its mainframe computers.

This approach will overcome IBM's three traditional weaknesses. The company has always lacked an integrated, compatible product line, especially in mid-range systems. Its software, particularly communications software, has been poor. The company's long-term strategy has been slipshod because IBM has moved only to protect its installed base.

Since this approach focuses on communications, the report said IBM and AT&T will continue to accelerate their corporate battles.

Having tried and generally failed at telecommunications efforts, IBM opted for a strategy of telecommunications acquisitions. According to Frost & Sullivan, IBM has purchased or allied itself with organizations already successful in various facets of the business, such as MCI Communications Corp. for long distance and data communications; Rolm Corp. for PBX equipment; and various alliances for their videotext services, financial

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information services. Frost & Sullivan expects to see more of this acquisition activity by IBM within the next 10 years. Potential target markets include value-added networks, fiber optics, earth stations, computer services and the regional Bell operating companies.

AT&T also sees communications as a gravy-train product area and made moves parallel to IBM's. The report predicted that AT&T does not have the marketing know-how or the size to compete head-to-head with IBM. Instead, AT&T will choose its spots and compete only where the communications company has a clear competitive edge.

The report costs $1,800. Frost & Sullivan is located at 106 Fulton St., New York, N.Y. 10038.

COS from **page 17**

more than 20 years.

The most astute academic minds in the country have worked with various government agencies to develop a network model that will connect different vendors' equipment. Because some of the work was done with military branches of the government, much of it has remained relatively secret. The most publicized work came from Advanced Research Project Agency Network (Arpanet), a research network used by a number of universities and government agencies.

Arpanet was the world's first packet-switching network. The network is based on a network model that resembles a seven-layer model for the International Standards Organization's Open Systems Interconnect model. In Arpanet, X.25 packet switching is used on the lower three layers, Transmission Control Protocol for Layer 4 and Internet Protocol for Layer 5. Extensions to these two layers are similar to Layers 6 and 7 of the ISO model.

The gradual evolution of this model clearly illustrates the problems stemming from interoperability. For many years, various government agencies were responsible for ensuring that different types of equipment would work in concert. The agency would examine pieces of equipment and then stamp its approval on the equipment.

The process worked well within one vendor's product line. For example, one piece of Honeywell, Inc. equipment usually would work with another piece of Honeywell gear. Occasionally, problems would arise when another vendor's equipment would try to talk with the Honeywell equipment. Users were saddled with the tasks of determining what the problem was and how it could be solved.

A few years ago, the government attempted to set up a testing center to ensure that all equipment would work together. At the recent TCP/Internet Protocol (IP) Vendor Workshop, the government informed a number of vendors that plans for the center were being dropped.

The reason was that testing was just too complex. Engineers designing network models are artists. From a broad outline, they paint a picture of how a network should operate. It is not surprising that these engineers may have radically or slightly different approaches to solving similar problems. Differences as insignificant as one bit can stop a file transfer dead in its tracks.

In order for COS to fufill its lofty goal, product differentiation would have to be minimal, a highly unlikely scenario. Vendors often use design differences to position their products in the market.

Another problem is that users often work with products in a manner far different from its original design. At the TCP/IP conference, an Air Force official told vendors that a Cray Research, Inc. supercomputer once malfunctioned. The system ceased operation when it had to perform a sort that was four times larger than the largest sort that the product designers thought the system would have to perform.

The goal of complete interoperability is appealing, but it does not appear to be very realistic. Given its current momentum, COS should yield some positive results along this front. The organization can do for networking what Microsoft Corp.'s MS-DOS operating system did for microcomputers. When the operating system started to gain acceptance, most software vendors tailored their packages to one implementation of MS-DOS, with the IBM Personal Computer being the most popular choice.

Despite the move to MS-DOS, users have been unable to take one version of the software out, plug it into a second machine and have it work. Inconsistencies in disk drives, screens or internal coding prevent that scenario from occurring. For example, different versions of a program are needed for an IBM Personal Computer AT and an IBM Convertible PC. On a positive note, software developers are able to port software from one MS-DOS machine to a second easily, and different versions tend to include almost all of the same type of functions.

COS should be able to establish a broad range of network standards that vendors can build upon. But users will be forced to determine how compatible these products are when they are hooked together on the companies' networks.

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> "There can be no argument to the view that the equal access election was a huge public ratification of AT&T. Yes, AT&T lost market share. That was the whole idea of divestiture and competition. However, it did not lose nearly as much share as some had expected. By any measure, it still has as many as 10 times the customers as its next largest competitor.
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> September

Market estimates of network management and control

Market sector	1986e	5 year growth rate
Product offering		
Performance monitoring and network control	$80M	30%
Network management and administration	$20M	35%
Test, diagnostics, patching and switching	$200M	35%
Service offering	$35M	40%

SOURCE: COMMUNICATIONS VENTURES, SAN FRANCISCO

ASSOCIATIONS

The International Communications Association (ICA), the International Telecommunications User Group (Intug) and the Telecommunications Managers Association (TMA) of the Institute of Administrative Management, will jointly sponsor the first Transatlantic Seminar, Oct. 16 to 18, in London.

The seminar will explore the telecommunications user experience in Europe and how it compares to the U.S. experience. The seminar will bridge an Intug meeting in London, Oct. 14 to 15, and a TMA conference in Brighton, England, Oct. 19 to 22.

The International Communications Association announced its second summer program has been scheduled for June 13 to 19, 1987, at the University of Colorado at Boulder, Colo.

▶ USERS GROUPS

Token-Ring users unite via E-mail

On-line organization shares tips, advice.

BY MARGIE SEMILOF
Senior Writer

LOS ANGELES — When Todd Booth runs into trouble with his IBM Token-Ring Network, it's not unusual for him to send out an electronic plea for assistance.

Booth, a network planner at the University of California at Los Angeles, is the organizer of a recently founded users group that links IBM Token-Ring users and aficionados around the world through an electronic mail network. Within minutes of placing his Token-Ring-related query on the users group's bulletin board, Booth will usually receive several helpful responses from other participants on the network.

> *"The users group boasts a following of at least 150 subscribers."*

The electronic mail net runs over Internet, an international network of networks operated by the Department of Defense. Internet is designed to link companies and research facilities involved in a variety of research projects.

By dialing into the network using a specific address for the Token-Ring group, members can communicate with both Token-Ring users and prospective users planning Token-Ring projects. As the group moderator, Booth compiles information received from other users into a weekly newsletter called the *PC/Token Ring Digest*, which is published on the bulletin board. Booth organized the group last May, and he claimed it already boasts a following of at least 150 subscribers.

"This week, subscribers are talking about how to hook TCP/IP on Ethernet networks to the Token-Ring," Booth said. "The users send messages over the network, requesting feedback from other members.

"I am currently working on a Token-Ring Network," he added. "If I get stuck, it really helps to broadcast my questions to other people. In a short period of time I may get several responses that can save me months of work."

Booth said the network provides a wealth of information to users attempting to connect Token-Ring Networks to other local-area networks, or users trying to interconnect a number of Token-Ring Networks via bridges to a mainframe. He said users can ask fellow Token-Ring customers questions that IBM might not wish to discuss.

"For example, if users want to link multiple Token-Rings by bridges, they may be concerned about slow response time when accessing the mainframe," he said. "That is a question IBM may not want to address.

"Through the network, customers can meet other users working on similar projects and share ideas," he added. "You may meet a user that has a trick to link two supposedly incompatible software programs."

Booth said another benefit of participating in the electronic mail network is that users can receive new programs developed by other users that help build gateways between networks. Communications managers can also trade information about Token-Ring products, including details about versions of Token-Ring software programs, before they are released by IBM. Subscrib-

See **Token Ring** page 22

GUIDELINES
ERIC SCHMALL

Advertising: playing on anxieties of communications managers

Flip through any communications publication and see how vendors try to seize attention for their message. Some use fear, and others offer soothing words and symbols of security. Some portray themselves as master puzzle-solvers.

Advertising is packed with images and symbols that convey a tremendous amount of interpretive information. Car manufacturers, for example, have not sold automobiles as simple transportation devices for decades. They sell concepts such as comfort, style, success, power and sophistication. These are often the more salient items being pushed to potential buyers. The marketing departments are appealing to — and some claim, creating — a demand for the product by addressing these other needs.

That same marketing style appears to be entering the communications industry now. Vendors are no longer just trying to sell modems or cables or private branch exchanges. They are selling job security to a group that must feel very uncertain about the future.

A quick survey of a handful of communications publications shows that over one-third of all advertisements go beyond the rudimentary form of displaying a product and underscoring it with some descriptive language. More sophisticated ads show staged scenes of life in the communications industry. They all are trying to appeal to deeper needs than simple information transportation.

Most of these advertisers set the stage by stereotyping the communications manager image. They are almost always depicted as male, white, clean-shaven, thin and young. They are yuppies with bright careers ahead of them. (A notable exception to this generalization is AT&T — it conscientiously includes women and minorities in its depictions.) Once that is established, the wider messages are then delivered.

Many vendors prey on man-

See **Ads** page 23

Schmall is network systems manager for an insurance holding company.

PEOPLE

William McCreary was named president and chief operating officer at Advanced Fiberoptics Corp.

☺

John Schroeder was appointed vice-president of the Datastream Networking Division of Lee Data Corp.

☺

William McDonald was named president of United Telephone Co. He was most recently senior vice-president of network development for US Sprint Communications Co.

☺

David Walker was named vice-president of engineering for National Gateway Telecom, Inc. Walker was most recently director of engineering program development for Pacific Telecom, Inc.

☺

Reed C. Wolthausen joins Zoran Corp. as vice-president of finance and chief financial officer. He most recently served as vice-president of finance and general manager of the X ray products division at Micronix Corp.

☺

ConferTech International, Inc. has elected **Joe Kellogg** to its board of directors. Kellogg is currently chairman of the board and chief executive officer of the Kellogg Corp.

☺

William M. Newport was appointed vice-president of strategic planning and development for Bell Atlantic Network Services, Inc. Also at Bell Atlantic, **Gerald J. Caccappolo** was named vice-president of software and systems development.

☺

Ken Oshman was appointed to StrataCom, Inc.'s board of directors. Oshman was founder, president and chief executive officer of Rolm Corp.

☺

Nancy Needham was appointed associate director of New York's Center for Advanced Technology in Telecommunications at Polytechnic University and academic director of the Center's Telecommunications Management Program.

Needham, a management consultant, is the founder and president of the Institute for Corporate Government Strategy.

☺

Douglas C. Phelps was appointed director of financial services at the Brand-Rex Cable Systems Division of Brintec Corp. Phelps was most recently Brintec's manager of general accounting.

Token Ring from **page 21**

ers also discuss Token-Ring-compatible products from vendors other than IBM.

"You may learn that one vendor's network card is not compatible with the Token-Ring, he said. "A vendor may not be willing to disclose that information."

Enthusiasts of the electronic mail users group are hoping the volume of correspondence for the Token-Ring electronic bulletin board will increase, just as mail for another network — the IBM Personal Computer bulletin board — has taken off.

> *"E-mail enthusiasts hope the use of the Token-Ring bulletin board will rise."*

Dave Hutchinson, associate director of systems and operations at Ottawa's Carleton University, accesses the Token-Ring bulletin board via Bitnet, an Internet subnetwork. Hutchinson is currently installing a Token-Ring Network on campus and he said his requests for information have solicited several helpful responses from other users.

"The network is an ex-

When you need a system the sum of its parts: Count

To maximize the availability of your data communications network today—especially multi-node T1 networks—you need a system that's even greater than the sum of its parts. At GDC, we know it's not just one part, but every part working together that makes your network a success.

Putting that knowledge to practical use has made GDC the leader in megabit multiplexing, with the largest installed base of private T1 networking products. We have maintained our leadership position with MEGANET, the ultimate service for cost-effective networking and control. It's the only solution that adds products plus services to equal a total networking system. A system that offers the broadest, most compatible line of products with built-in flexibility that work together to fit your particular communications requirements; from sophisticated multiplexed or switched multi-node T1 networks, to simple local area access.

Even more importantly, MEGANET includes comprehensive service and support with extensive people management capabilities for installation and training. With MEGANET, it all adds up to a total networking solution you can count on.

Multiply your wide area networking capabilities.

GDC's software-based MEGAMUX® II, a fourth-generation multiplexer, multiplies your multi-node T1 networking like never before.

It represents 10 years of GDC leadership in T1 multiplexing. It accommodates up to 16 aggregate links, with aggregate rates up to 2.048 Mbps. It includes an auto-frame feature to maximize efficiency of bandwidth allocation in multiple node, multiple aggregate networks. It uses the same data and voice channel cards as GDC's MEGAMUX® PLUS and KILOMUX™ PLUS multiplexers to provide flexible, compatible and cost-effective configuration. And it incorporates redundancy and diversity switching to ensure reliability, with pre-programmed alternate routing in case of line failure.

With three types of voice channels, plus centralized control and management via GDC's NETCON® Network Management System, MEGAMUX II is the next step to higher level networking.

Network flexibility that branches out to every area.

A truly flexible communications system extends the reach of your network in every direction, including the latest technological developments in packet switching.

With our GEN*NET® family of concentrators, and our GEN* PAC X.25 PAD access devices, you have your own link to a packet-switched network. For high-speed, high-density applications, they offer the most economical, reliable way to connect geographically dispersed computers and terminals.

Eliminate network errors with greater accuracy and reliability.

It's a fact that 75% of the major telecommunications carriers in North America have standardized on GDC data sets for internal use and resale. Why? Because our analog, digital and down-line programmable data sets offer greater performance, reliability and cost-effectiveness. They give you the broadest selection available for switched and private line networks. And they incorporate many features to help eliminate costly and time-consuming errors.

In addition, they include GDC's exclusive DataCommonality modular packaging to reduce spares and simplify operation and maintenance. The same plug-in circuit card can be used for both standalone and rack-mount units; front only access provides for ease of installation, quick changes and adjustments. And you can upgrade efficiently and cost-effectively within a limited network area, easily moving from lower to higher data speeds or from dial-up—switched network—to leased line operations.

cellent way to exchange technical information without having to go through a salesman," he said. "Other users have contacted me to tell me they have tried what I am about to try. They offer advice on what bugs to look out for.

"I am too busy managing to be involved in the technical aspects of the network," he added. "Usually we browse through the correspondence. In one case, several users were communicating about a particular bug in a software package. Within a few hours, another user sent a message about how he was able to avoid the problem."

To subscribe to the *PC/Token Ring Digest*, users must have access to the Defense Department's Advanced Research Projects Agency Network or one of its subnetworks.

The cost of the newsletter and the use of Internet is paid for by Defense, which considers the network to be a research project and thereby eligible for federal funding. To reach other Token-Ring customers, users should send their electronic mail messages to Booth's Internet address at PC-Token-Ring-Request @ OAC.UCLA.EDU.

Ads from **page 21**

agers' anxieties. Hewlett-Packard Co.'s ad shows a furrowed brow and the dreaded words, "I want to know why the network is down. And I want to know now!" Infotron Systems Corp. follows this pattern with added drama: The photograph has the reader perched on a window ledge with the quotation, "We just lost Pittsburgh! Where's the datacomm manager?"

These less-than-pleasant reminders of the inherent risks of the daily operations in communications have powerful, attention-grabbing effects.

Many vendors address the manager's need for career security without this lazy man approach. Instead, these vendors offer the reader calm reassurances of peace and comfort in the difficult life of modern communications. Contel Business Networks displays the cool symbolism of a lighthouse together with the slogan "Something to depend on."

Verilink Corp. shows a smiling manager, instead of a suicidal one, saying its product "just made someone look mighty good."

Racal-Milgo, Inc.'s drawing shows a man heading into a desert but offers that "you don't have to go it alone."

It's easier to linger over these kinds of messages rather than the stomach-churning reminders of disaster, but the message is similar: Communications managers can buy security through acquiring those products.

Another popular approach, somewhat removed from the direct issue of appealing to job security, involves global simplification of a difficult task. These ads cluster around problem-solving or putting-it-all-together themes. Tailors, oddly enough, are popular symbols.

Both American Satellite Co. and Kee, Inc. use that time-honored craft as a comparative example of their services. Tellabs, Inc. uses a Rubik's Cube-like device to convey its message. AT&T projects pieces of a global puzzle to portray its VIS service. A number of vendors like to establish globes or worldwide maps as part of their message.

Many like to use starry nights or deep space backgrounds to give their products a universal theme. These all have easy appeal for managers who must contend with the real world of incompatible components, nonstandard services and the postdivestiture conflicts that make life a challenge. As competition grows, managers can expect that marketing techniques will continue to grow more sophisticated.

The wise observer of this process should become more alert to specifically what is being sold. That will keep the process grounded in organizations' real needs.

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Add greater economy and efficiency to your local area network.

The range and flexibility of GDC's products give you the ability to expand your local area network to greater distances at even greater speeds—extending it from desk to desk, building to building, city to city. By integrating our network management and diagnostic control capabilities, you can tie your local area network into a higher level system worldwide and still control it from a centralized point.

Together, our products cover the full range of local area and wide area networking applications. From our data sets and DATX™ data-over-voice products that provide the ultimate in simplicity and economy by offering plug-in installation and operation, Data-Commonality packaging, and an automatic equalizer that adjusts to changes in line transmission; to our more sophisticated multiplexing and switching equipment.

We've got the solution to managing and controlling your network.

With GDC's NETCON family of Network Management Systems, you have the total solution to maximizing your network's operational efficiency.

NETCON gives you unsurpassed multi-level control over a wide range of facilities; digital network architectures, multiplexing systems, data sets, and local area networks. It provides comprehensive, sophisticated network management from a single centralized operating center. It assures total network availability with continuous surveillance; instant alarm, restoral and management reporting; and unparalleled diagnostic testing and control. And it provides inbound diagnostics and pre-equalization by individual drop on multi-point services.

Designed for maximum flexibility and total service, NETCON helps you meet the challenges of ever-changing applications and requirements while assuring total network availability. And its compatibility allows integration without obsoleting existing equipment.

There's no end to what we can do for you.

When you invest in T1 high-capacity systems and their associated data communications networks, you expect much more than reliable products. With GDC's MEGANET, you get all the network service and support capabilities as well as a full range of products, that you'll ever need.

MEGANET manages your network with greater economy and efficiency. It addresses the multiple vendor problem by offering a total, single vendor capability. It addresses the changing technology problem by offering the most complete, technologically advanced products in the industry. And it addresses the network responsibility and control problem by controlling it from a single source.

Indeed, with MEGANET, you have a total solution to all your networking problems.

To find out more, contact Product Information Department, General DataComm, Inc., Middlebury, CT 06762-1299. Or call 1-203-574-1118 Ext. 6456.

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Our systems are solutions.



SOMETHING BRILLIANT JUST HAPPENED TO DATA TRANSMISSION.

Introducing Public Data Network* from the Bell Atlantic Network Services Group. A startling communications development that's just made other interactive data transmission modes seem all but obsolete.

Packet Switching goes public.

Public Data Network offers the benefits of packet switching—through the telephone network—at speeds up to 9600 bps. By batching data into electronic "packets," Public Data Network is ideal for "bursty" applications like order entry, billing, information processing, credit approval, reservations, ticket sales and claims.

Suddenly, there's a more efficient way to move data.

Our Public Data Network is, without a doubt, the most efficient way to move interactive data. Period. What's more, rates are usage-based—dramatically lower than dedicated line costs.

Introducing automatic protocol conversion.

And because Public Data Network supports X.25 and asynchronous protocols, it's the perfect link between dissimilar data processing equipment. Like office and home computer terminals and multiple data bases. It also opens the door for electronic banking and electronic shopping and a long list of other interactive electronic subscription services.

A host of advanced network solutions.

In addition to Public Data Network, the Bell Atlantic Network Services Group provides an array of customized services to precisely match your communications needs.

From voice circuits to a variety of digital data services including High Capacity Digital Service and fiber-optic-based High Capacity Lightwave Service, we offer full duplex dedicated and switched digital data transmission at speeds ranging from 300 bps to 560 megabits. On a point-to-point or multi-point basis.

We're the customized network services experts.

Without optimized network transmission capabilities, your communications system is handicapped. That's where we come in. By applying our most valuable asset—our network expertise—we can unlock your system's potential, adding value through increased operating efficiency.

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"An article appeared in Network World on T-1s and vendor relationships... I did what the article said, and it worked!"

Fred Reitberger is a communications analyst involved in both data and voice communications at COM Energy in Cambridge, MA. He is responsible for strategic analysis and planning, as well as making purchase recommendations for communications products and services.

"Most of the communications publications are just regurgitated press releases supplied by vendors, but the information in *Network World* is researched," says Fred. "*Network World's* writers choose a broad topic, then pick three or four key items and go into detail about them. When something does come from a vendor, you know because it appears in the 'Vendor View' section. It's a well-done publication."

Network World's editorial gives readers the information they need to do their jobs more effectively. "An article appeared in *Network World* on T-1s and vendor relationships in which a comment was made on how to handle a vendor," explains Fred. "I did what the article said, and it worked!"

Fred, who participated in a focus group designed to find out what communications users thought about *Network World's* prototype issue, felt that *Network World's* editorial staff listens to their readers. "I mentioned that it wasn't clear the Opinions page was an opinions page, and, when the first issue came out, the Opinions page was marked in big bold letters. They listened to me."

Network World is the first and only newsweekly written specifically for communications users. Over 60,000 buyers, like Fred Reitberger, look to *Network World* for the information that can help them — and their companies — stay ahead. If you market communications products and services, there's no better place to reach a powerful audience of communications buyers. Contact your local *Network World* sales representative and reserve space for your ad today.

NETWORK WORLD

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NEW PRODUCTS AND SERVICES

See inside for:
- ▶IBM 3162 terminal
- ▶Desktop data switch
- ▶X.25 monitoring unit

AUTOMATED CALLING

Davox dials deadbeats

System calls those who owe, transfers calls to operators.

BY JIM BROWN
New Products Editor

BILLERICA, Mass. — An automatic telephone calling system geared for credit collection departments and customer service operations was unwrapped recently by Davox Corp. The product, dubbed Computerized Autodial System (CAS), was introduced along with the Davox 4900 and 5900 intelligent workstations, which boast windowing capabilities and Digital Equipment Corp. VT220 terminal emulation.

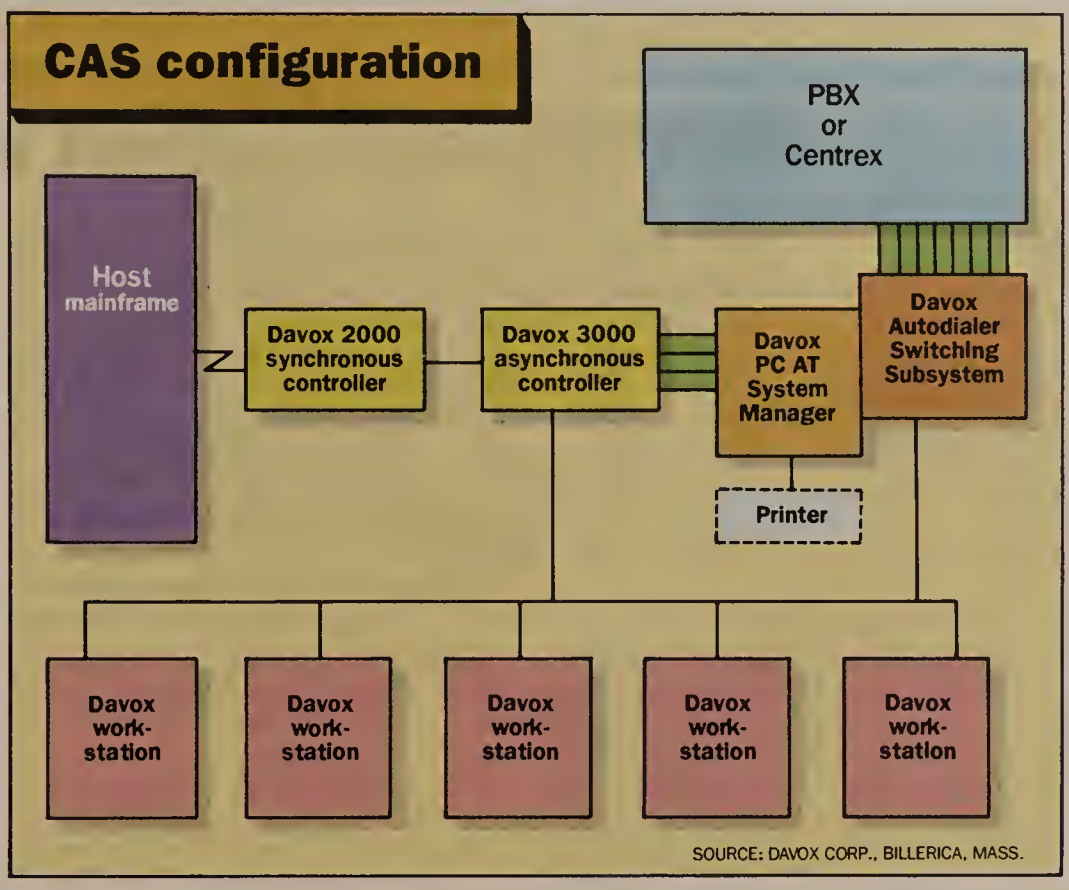
The $125,000 CAS consists of Davox software, synchronous and asychronous Davox communications controllers, an IBM Personal Computer AT serving as the system manager, a private-labeled eight-line autodialer interfacing to a private branch exchange or Centrex service and five Davox 1900 integrated voice/data workstations. Connections between workstations and controllers are made with either twisted-pair wire or coaxial cable.

The Davox 2000 synchronous controller, which emulates IBM 3274-21C or IBM 3274-61C cluster controllers, links the calling system to an IBM host. A Davox 3000 asynchronous controller attaches the Personal Computer AT to the Ascii-based Davox 1900 single-screen workstations. The workstations are designed to look like IBM 3278 or IBM 3178 terminals when communicating in IBM's Systems Network Architecture/Synchronous Data Link Control, Binary Synchronous Communications or asynchronous networks. The workstation also appears as a VT52 or VT100 terminal to Digital Computer Corp. minicomputers.

CAS is aimed at the early cycle of credit collection, those accounts that are between 15 and 30 days overdue. The system dials customers' home and work numbers, and when a connection is made, passes the call along with the customer's account file to a live operator. The operator can either handle the call or play one of 16 prerecorded mes-

See **CAS** page 29

CAS configuration



SOURCE: DAVOX CORP., BILLERICA, MASS.

MICRO TO MAINFRAME

Micro Tempus uncovers data-extraction tool

IBM MVS system uses Tempus-Link.

BY JIM BROWN
New Products Editor

MONTREAL — Micro Tempus, Inc. recently pulled the wraps off a micro-to-mainframe data-extraction tool that runs on IBM mainframes with the MVS operating system. The Tempus-Access package reportedly supports use of personal computer commands to compile requests to search, extract and download portions of mainframe resident data base files.

The announcement comes on the heels of Lotus Development Corp.'s introduction last July of The Application Connection, a package that draws and reformats data from IBM mainframes and transmits it to personal computers for use in spreadsheets and other applications.

Lotus' product, however, only works with mainframe-based fourth-generation languages. The Tempus-Access package is also being introduced after IBM announced last June it would unveil its Advanced Connection Facility micro-to-mainframe data-extraction tool later next year.

The Tempus-Access package runs under Micro Tempus' Tempus-Link micro-to-mainframe link package, which creates virtual disks on IBM mainframes.

Both Tempus-Access and Tempus-Link packages are based on the Host Application Program Interface, a program-to-program interface tying personal computers to IBM mainframes.

Tempus-Access consists of a DOS/VSE personal computer package that talks with a companion MVS/TSO or MVS/CICS package on the mainframe. Tempus-Access also requires the use of a DYL-270 data-extraction package provided by Sterling Software, Inc.'s Dylakor division. DYL-270 accesses Sequential, Isam, Bdam and Vsam file structures on IBM mainframes running under MVS. Optional software interfacing Tempus-Access to IBM's IMS, and DL/1, and Cullinet Software, Inc.'s IDMS and IDMS/R packages have also been announced.

Personal computer Tempus-Access users create customized file sorts by filling in blanks on a data-

See **Extraction** page 29

SOFTWARE

LU 6.2 aid for PC users

NSA tool builds APPC applications.

BY JIM BROWN
New Products Editor

LAGUNA HILLS, Calif. — Network Software Associates, Inc. (NSA) last week introduced software that allows users to develop personal computer applications based on IBM's LU 6.2 communications protocol.

NSA's personal computer-based package, dubbed AdaptSNA LU 6.2/Assist, includes an applications subsystem or shell, interactive tutorial facilities and high-level language interfaces for each LU 6.2 verb. It is a tool kit that helps applications developers test and build programs that communicate with other LU 6.2-based applications running on other processors.

The package is used in conjunction with AdaptSNA LU 6.2/APPC — NSA's implementation of IBM's LU 6.2 or, as it is also known, Advanced Program-to-Program Communications (APPC) — and is designed to work in IBM's Systems Network Architecture/Synchronous Data Link Control (SDLC) environments.

The AdaptSNA LU 6.2/Assist package provides development tools used in creating APPC applications and lessons aimed at helping the applications developer understand the method of creating APPC-based applications. It allows applications developers to compile APPC-based programs in Basic, C or Assembly languages, as opposed to Assembly-only, as in IBM's APPC package.

AdaptSNA LU 6.2/APPC provides the link between a personal computer and either another personal computer, a minicomputer or a mainframe. The application-to-application communications between systems is supported by the LU 6.2 protocol running under Physical Unit Type 2.1, which allows either end of the link to control the session.

The AdaptSNA LU6.2/Assist package requires 256K bytes of memory, IBM's PC-DOS Release 2.0 operating system and a Synchronous Data Link Control adapter. AdaptSNA LU 6.2/Assist is priced at $345. AdaptSNA LU 6.2/APPC is priced at $150.

▶HARDWARE

IBM 3162 announced

Terminal can imitate six vendors' wares.

RYE BROOK, N.Y. — Recognizing there is another world outside its door, IBM announced a terminal that can be made to look like a terminal from any of six other vendors, including Digital Equipment Corp.

The IBM 3162 terminal is equipped with a 14-inch monochrome display screen in either green or amber-gold phospher and a 102-key Ascii keyboard. The device can emulate an IBM 3101 or 3161. With add-on cartridges, the 3162 will look like terminals made by DEC, Televideo Systems, Inc., Lear-Seigler, Inc., Applied Digital Data Systems, Inc. (Adds), Hazeltine Corp. and WYSE Technology, Inc.

IBM offers four different emulation cartridges that plug into the 3162's logic unit. One provides emulation of DEC's VT52, VT100 and VT220 terminals. Another provides a hot key supporting transfer between DEC emulation and 3708 protocol converter modes.

With IBM's 10 Ascii Emulations cartridge, the 3162 will emulate Televideo Systems' 925, 925E, 910, 910+, 912 and 920 models; Lear-Seigler's ADM 3A/5; Adds' Viewpoint A2; and Hazeltine's 1500. A WYSE Emulations cartridge supports emulation of WYSE's 50 and 50+ terminals in addition to the terminals supported by the 10 Ascii Emulations.

The 3162 terminal's eight different models come with 24 definable function keys and can be configured to operate at speeds up to 19.2K bit/sec in either full- or half-duplex mode. The terminal comes with either an RS-232-C port for $645 or both an RS-232-C and RS-422-A for $724. The 3162 models 110,120, 310 and 320 will be available in October, while the models 210, 220, 410 and 420 will be available early next year.

The DEC and 10 Ascii Emulations cartridges will be available in October for $50 each. The $50 WYSE cartridge and the $60 DEC Emulation cartridge with a 3708 hot key will be available in November.

IBM also announced new 3163 and 3164 terminal keyboards and cartridges that support the extended American Library Association character set. The 3163 model 860 terminal costs $976, while the 3163 model 861 is $985. The 3164 model 860 lists for $1,376, while the 3164 model 861 is $1,385.

▶TCA

ComDesign will unveil data switch

GOLETA, Calif. — ComDesign, Inc. is expected to introduce a desktop data switch at the Telecommunications Association show in San Diego later this month. The firm said it will unveil its CX1500 data switch, which is reportedly capable of supporting up to 144 local asynchronous lines at 9.6K bit/sec. A smaller version of the firm's CX3000, the device is designed to connect terminals or personal computers to nonblocked host computer ports. It can be used to support 72 terminals connected to 72 host ports or to support port contention allowing more than 72 connected terminals or personal computers to vie for host connection over the remaining unused lines.

The device will also switch a terminal's connection from one host port to another. The 144 supported lines can be organized into 75 caller classes and 75 destination classes.

The CX1500 consists of a chassis with 10 card slots, six of which will support line cards. Each line card supports 24 lines. The device is operated by a two-card control set. An Exec card, equipped with an Intel Corp. 80186 microprocessor, controls the system configuration in nonvolatile memory and establishes connections between lines. A Switch card uses custom logic to perform switching when connections are made. The line cards and control cards are compatible with the higher capacity CX3000 data switch.

The chassis has room to support another two-card control set that will yield a redundant control system to take over system control and maintain operation should the first control set fail. The device provides backplane bus redundancy by duplicating data and control lines.

A system that consists of a 10-slot chassis, a power supply, a system control card set and three line cards supporting 72 lines is expected to be priced at $7,600.

Products & Services

X.25 monitoring unit

Dynapac Packet Technology, Inc. announced a device that monitors and produces records for up to 20 concurrent X.25 communications sessions.

The **Multi-log X.25** unit is typically attached to an X.25 trunk running the bit-oriented link access procedure protocol. It is positioned between a packet assembler/disassembler or a host computer and a modem. It monitors the packet level data frames sent in each of up to 20 concurrent transmissions, determines sender and receiver locations of each transmission, reports which location is responsible for transmission charges and notes the date, time and duration of each transmission. Data is sent to a local printer or a computer system through an RS-232 connection.

The Multi-log X.25 costs $2,995.

Dynatech Packet Technology, Inc., 6464 General Green Way, Alexandria, Va. (703) 642-9391.

VAX Cluster emulation

System Industries, Inc. unveiled a system that links up to 16 Digital Equipment Corp. VAX superminicomputers over an Ethernet-based local net.

Called **SI Link,** the system consists of software running on a System Industries 9900 series or compatible file server operating over an Ethernet network.

The software emulates VAX Cluster functions on VAX superminicomputers running under VMS operating system Release 4.0 or above. The Ethernet network passes control information between VAX superminicomputers, while the server handles data transfers.

SI Link delivers VAX Cluster functions that include distributed file and record sharing, distributed batch job and print queuing and distributed lock management.

It also supports multiported disk controllers and dual path disks. It can be configured for direct memory access or mass storage control protocol systems.

An SI Link package that supports two VAXs lists for $10,000; a package that supports three or more VAXs costs $11,000.

System Industries, Inc., 1855 Barber Lane, Milpitas, Calif. 95035 (408) 942-1212.

Enhanced 3270 emulator

Network Software Associates, Inc.'s (NSA) IBM 3270 emulator for IBM Personal Computers now supports multiple concurrent mainframe sessions and routes host print files to a disk.

NSA's **AdaptSNA 3270** allows Personal Computer-to-mainframe communications in an IBM Systems Network Architecture environment. The software emulates an IBM 3274 controller equipped with IBM 3278 or 3279 terminals and a 3287 printer.

The new multisession feature allows a Personal Computer user to run multiple applications concurrently on a mainframe. The user can toggle between host applications by pressing one key on the Personal Computer keyboard. The previous version had supported up to three screen sessions and two printer sessions simultaneously.

AdaptSNA 3270 operates over leased, point-to-point and multidrop lines at speeds up to 9.6K bit/sec.

NSA sells the software alone for $585. A Synchronous Data Link Control (SDLC) adapter board and synchronous modem are needed. The software plus NSA Adaptcom SDLC adapter board is priced at $830.

The software plus NSA's Adaptmodem 2400, a combination SDLC adapter and 2,400 bit/sec modem, is $1,380.

The software plus Adaptmodem 4800 with a 4.8K bit/sec modem is $1,780.

Network Software Associates, Inc., 22982 Mill Creek, Laguna Hills, Calif. 92653 (714) 768-4013.

Eight-port coax mux

Fibronics International, Inc. announces an eight-port coaxial multiplexer, the **FM 3299,** which can serve as an alternative to IBM's 3299 multiplexer.

The FM 3299 allows up to eight remote peripherals to access IBM 3274 Type A or Memorex Corp. controllers over a single coaxial cable. Data can be transmitted up to 10,000 feet between controllers and Type A terminals or printers.

The FM 3299 attaches to the 3299 adapter of an IBM 3274 controller via a standard coaxial cable BNC connector. LED indicators display the muliplexer's backbone performance and the status of each channel. The device features a built-in power supply.

The price for an FM 3299 is $800.

Fibronics International, Inc., 325 Stevens St., Hyannis, Mass. 02601 (617) 778-0700.

14.4K bit/sec full-duplex modem

Universal Data Systems announced its model **V.33** modem that transmits full-duplex data at 14.4K bit/sec over unconditioned four-wire private lines.

The device is compatible with CCITT V.33 standards.

Transmission speed automatically falls back to 12K bit/sec or 9.6K bit/sec if phone line quality deteriorates. At 12K bit/sec, the modem is CCITT V.33 compatible; at 9.6K bit/sec, it is CCITT V.29 compatible.

The V.33 includes trellis-coded modulation and automatic adaptive equalization to reduce the need to retransmit data.

Trellis-coded modulation reduces the error rate on worst-case private lines. Adaptive equalization compensates for line distortions without the need for pre-equalizers.

The V.33 also contains diagnostic circuitry that can isolate faults in the modem, phone line or terminal equipment, either locally or remotely.

The price of the modem is $2,995.

Universal Data Systems, 5000 Bradford Drive, Huntsville, Ala. 35805 (205) 721-8000.

CAS from **page 27**
sages.

Davox claims the CAS increases productivity in environments requiring high volumes of outgoing calls because only live calls are getting through to the operator. "We're talking to a banker about — guess what — collecting money faster," said Daniel A. Hosage, president and chief executive officer.

A department supervisor downloads phone numbers and customer account information from the mainframe to the Personal Computer AT, where they are stored in an attached 30M-byte hard disk. The supervisor also configures the downloaded information into customized Davox 1900 workstation screen formats.

The entire phone list is placed in a queue within the Personal Computer AT, and numbers are passed eight at a time to the autodialer. If the number is busy or has not answered within a specified number of rings, the number is sent back to the AT and a notation is made in the customer's file.

If the line is answered, the call and customer file are sent to a live operator. The operator fills in information on the screen and sends completed customer files back to the AT. At the conclusion of the cycle, all customer files are loaded back to the mainframe with updated information.

The Davox 1900 workstation is also capable of going on-line to the mainframe to access updated customer account files or other mainframe resident data while talking with customers.

The autodialer can be programmed to operate automatically or manually. In automatic mode, the system calls numbers until all eight lines are busy and determines the average length of each call before resuming its calling function. In manual operation, the department supervisor programs the amount of time between calls on each line.

While CAS is also being aimed at telemarketing, order entry and customer service operations, credit collection remains the firm's self-avowed market niche. "We're not trying to be all things to all people," Hosage said.

CAS will be beta-tested in a St. Louis, Mo., bank starting later this month and will be available in January 1987.

In addition to the features included on the Davox 1900 workstation, the currently available Davox 4900 and Davox 5900 workstations have windowing capabilities that allow operators to view several mainframe sessions on the screen at once and toggle between them. Also added to the Motorola Corp. 68000 microprocessor-based workstations was a DEC VT220 terminal emulation feature and expanded memory supporting up to 512K bytes. The Davox 4900 workstation will list for $2,695, and the Davox 5900 lists for $2,995.

Extraction from **page 27**
extraction request screen with the up to 60 data fields to be viewed, the sorting order and the parameters of the data to be extracted. In order to reduce processing time, users can also specify the maximum amount of records to be viewed in any one job order.

The company claims Tempus-Access personal computer users can make a single request to extract data from multiple mainframe data bases and present the data in a user-defined format.

The request is passed to the mainframe resident package over a communications link. The mainframe package converts the data-extraction request to DYL-270 statements and injects it into a DYL-270 data profile.

The data profile contains a user-defined DYL-270 query skeleton that can be defined to prevent access to certain files and record fields by failing to implement requests to access them.

The converted data request is implemented in batch mode by DYL-270. Once the desired information has been extracted, the DYL-270 package passes it to the mainframe resident Tempus-Access. The extracted data is converted to a form usable on the personal computer and placed in a mainframe virtual disk that is accessible from a personal computer.

Each transaction is also logged and listed in another virtual disk that can be browsed by personal computer users before the data is downloaded.

Bundled with a DYL-270 package, Tempus-Access MVS/TSO and MVS/CICS packages list for $13,900. The Tempus-Access DOS/VSE version costs $9,900. Users with DYL-270 already installed can acquire a Tempus-Access MVS/TSO or MVS/CICS package for $9,500 and a DOS/VSE version of Tempus-Access for $6,900. Optional software interfaces between the MVS Tempus-Access package and IBM's IMS and DL/1 as well as Cullinet Software, Inc.'s IDMS and IDMS/R data bases are priced at $6,300 each. The optional interfaces installed on the Tempus-Access DOS/VSE cost $4,700 each. The MVS/TSO will be available in November. The MVS/CICS and DOS/VSE versions will be available in 1987.

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Opinions

PACKET-SWITCHED SERVICES

MARK WINTHER

Local services lagging

The long list of business and residential applications envisioned for local telephone company-supplied packet-switched data communications services includes commercial information data base access, corporate timesharing, credit verification, electronic messaging, home shopping and many other services. Most of these, however, have failed to materialize.

Furthermore, the low data port costs of local packet networks are expected to put the world of desktop terminal users on-line.

This is a formidable objective; and although local packet networks are too new to have a track record, a brief review of current users and applications reveals they have a long way to go.

The most significant users of local packet switching today are information providers like Dow Jones and Company, Inc. and CompuServe, Inc. and value-added interexchange carriers such as Tymnet/McDonnell Douglas Network Systems, Inc. and ITT Corp.

Other users include educational institutions, which use the services to share computing resources, and banks and merchant retailers, which use packet switching for point-of-sale (POS) authorizations.

As yet, there is little activity involving intracorporate communications and time-sharing applications.

However, one corporate niche application that has emerged involves connecting employees working at home to corporate data bases.

Information providers and systems operators (IP/SO) are attracted to local data networks not only because they provide cheaper access for existing subscribers but because they promise to extend the IP/SO's reach into markets with upscale demographics. Areas like Connecticut, Northern New Jersey, Baltimore and Washington, D.C., which were among the first to have tariffed local packet networks, tend to have a greater number of personal computer users and consumers of on-line data bases than the national average.

Information provider CompuServe has been quickest to tie in to local packet networks. CompuServe can now be reached via local packet networks in Connecticut, Northern New Jersey and the Washington, D.C./Baltimore area.

Also, users in Connecticut can reach Dow Jones' Dowphone via Southern New England Telephone Co.'s ConnNet packet network.

One of the first local packet networks offered, ConnNet provides more cost-efficient access to IP/SO data bases. This makes the Connecticut marketplace more attractive for the information providers. It also adds more information to the ConnNet network, making it a more attractive service for end users. In the Midwest, Mead Data Central, Inc., provider of Lexis and Nexis legal data bases, joined with Ohio Bell for an intra-local access and transport area trial of protocol conversion, using the telephone company's packet network.

Packet networks offer a low-cost data highway to other categories of system operators such as insurance claims processors and electronic mail service vendors. Through a subsidiary called ProMed Systems, Inc., Blue Cross & Blue Shield of Connecticut offers physicians and hospitals the ability to submit claims electronically, using ProMed's computer systems and ConnNet.

One of the first users of ConnNet is Old Greenwich, Conn.-based Electronic Mail Corp. of America (Emca). Emca and Southern New England Telephone have agreed to market and support Emca's Gemservice in conjunction with ConnNet.

The first commercial interconnection of a value-added network with a local packet network occurred in January, when Tymnet and ConnNet joined up. In April, ConnNet entered a joint venture with Worldnet, ITT's international packet-switched network. Both vendors use X.75 gateways for interconnection.

The educational sector was among the earliest users of local packet-switched services. Minneapolis-based Northwestern Bell Information Technologies, Inc., a subsidiary of US West, Inc., supports two educational applications with its Public Packet Switch Network (PPSN). Research Equipment, Inc., an affiliate of the University of Minnesota, offers advanced compúting facilities used by scientific researchers nationwide. The Minneapolis public school system has 70 locations

See **Packet** page 40

Winther is director of new communication services at Link Resources Corp. in New York.

STANDARDS

ALAN PEARCE

From Pots to Pans

John L. Clendenin, chairman of the board at BellSouth Corp., recently stated that common domestic and international standards are the key to the promise of the information age. Common standards, he says, must establish network access for everyone at reasonable prices.

According to Clendenin, the standards issue includes network architecture, equipment, services, performance and interfaces.

Clendenin says there is a need for greater cooperation between the Bell operating companies, the independent telephone companies, the overseas Postal Telephone and Telegraph administrations, the Federal Communications Commission, the equipment manufacturers, the interexchange carriers and the major users, among others.

Pearce is president of Information Age Economics in Washington, D.C.

Although solutions to common standards are not yet obvious, Clendenin says he is convinced the industry is moving from Pots (plain old telephone service) to Pans (pretty amazing new stuff).

Clendenin, as usual, is correct, and his speech tracks the recent FCC decision in the Third Computer Inquiry.

In the Third Computer Inquiry, the FCC has adopted the basic principle that AT&T and the BOCs should be able to offer a wide array of enhanced information services without having to establish a separate subsidiary if they afford "equal access" to competing services.

The decision in Computer III says a lot about two concepts — Open Network Architecture (ONA) and Comparably Efficient Interconnection (CEI) — that pave the way for the development of standards in the domestic telecommunications industry.

CEI refers to a set of standards that define equal access.

It also refers to plans for standards that AT&T and the BOCs may develop between now and the time they implement ONA, some time in 1988.

The FCC says there are six conditions that best describe ONA:

- ONA is the unbundling of basic service and the provision of equal access
- ONA plans must demonstrate that CEI standards will be met.

"Implementation must incorporate a technical design that satisfies the CEI parameters," according to the recently published decision.

- Regulated carriers' collocation of basic and enhanced facilities will receive FCC scrutiny in the ONA environment.
- ONA will be required by FCC rule in 1988 regardless of whether the regulated carriers intend to offer unseparated enhanced services.
- ONA is a precondition to complete structural relief.
- ONA is only a concept, or several concepts, and therein lies the standard's problem.

The BOCs and AT&T may file several different ONA plans, all of which may be approved by the FCC, thereby creating confusing standards.

In Computer III, there are five parameters for judging technical comparability of the interconnection of carriers and competing enhanced information services:

First of all, the two forms of interconnection must be functionally equivalent.

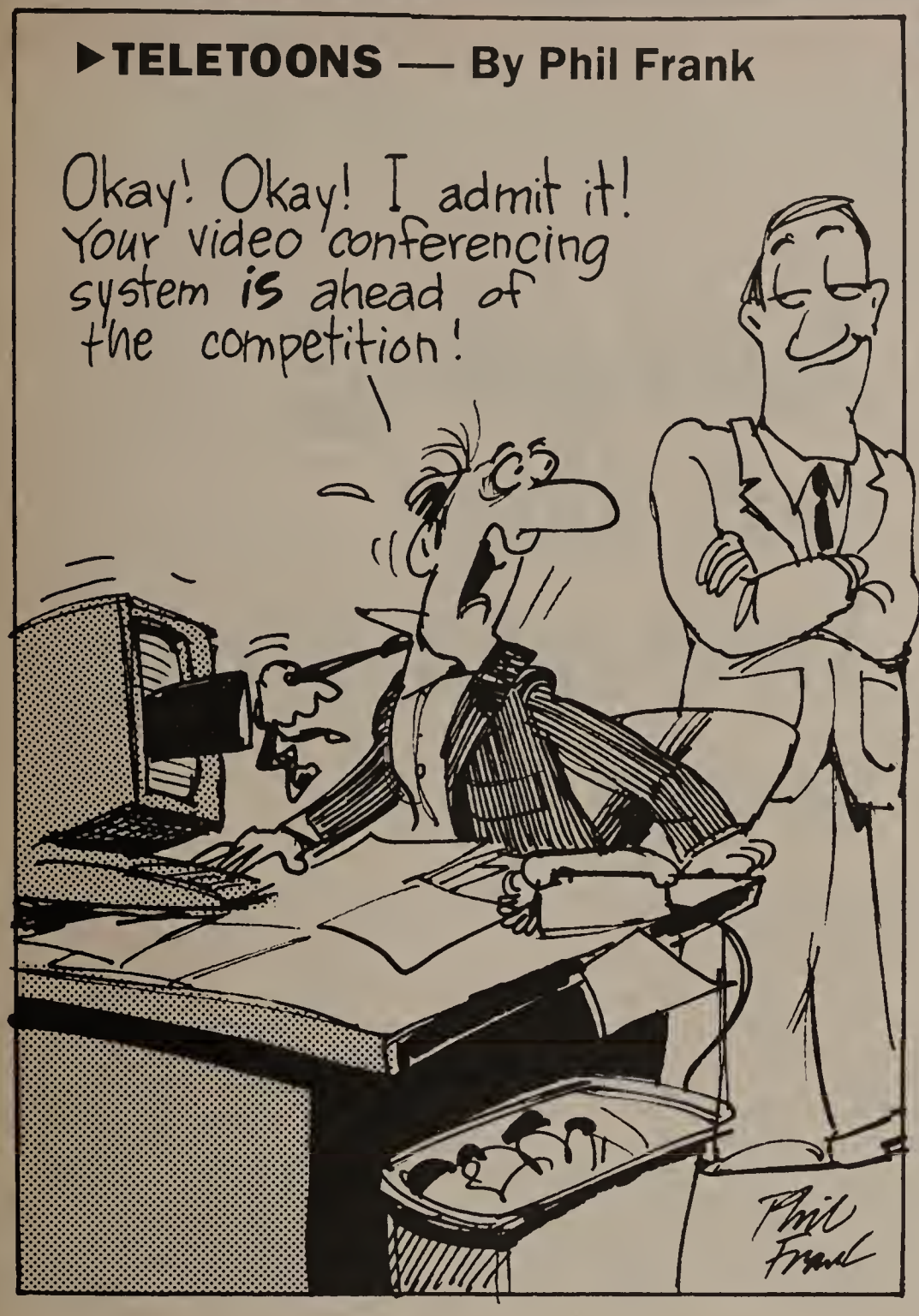
Secondly, the carriers must provide their competitors with all basic services on an unbundled basis.

Third, time periods for installation, maintenance and repair of basic services relied on by an enhanced information services provider must be the same for both carrier and competitor.

The fourth parameter states that end-user access to carriers and competing enhanced information services vendors must be comparable in price and quality.

Opinions

▶TELETOONS — By Phil Frank



Finally, if the carrier does not permit its competitors' facilities to be collocated, the carrier must provide special interconnection facilities, such as multiplexing, to minimize the transportation costs of competitors.

Another function served by Computer III is the outlining of four pricing controls:

Basic interconnection costs

These are the carriers' costs for modifying or adding facilities to provide interconnection between basic and enhanced services.

The FCC has mandated price averaging here, saying that enhanced information services providers, including the carriers, must bear a share of the total costs of these interconnection facilities.

Traffic concentration costs

These include multiplexing equipment located in the carriers' network facilities that are necessary to minimize transport costs. These costs will be recovered on a price averaging basis through a basic concentration charge.

Distance-sensitive costs

The carriers can charge each enhanced information services provider the actual costs of facilities used.

Network usage costs

These will be recovered through standard tariffed charges.

The impact of ONA, CEI and pricing controls on international telecommunications standards and services — both basic and enhanced — is being considered as part of Phase II of Computer III.

All of this is easier said than done, of course.

There will be many problems and much confusion on the rocky road from CEI to ONA.

As Clendenin says, solutions to common standards are not yet obvious. And if an acceptable industry-wide set of standards does not become obvious in the next two to three years, the industry could end up dealing with chaos.

If that does, in fact, happen, the nation may have to wait awhile for Clendenin's pretty amazing new stuff.

REGULATORY ISSUES

JOEL SWERDLOW

Making of a commissioner

Imagine you are a U.S. senator sitting on the communications subcommittee of the Commerce Committee. A new member of the Federal Communications Commission is up for confirmation. The hearing room is packed.

You can ask any question, like, "What are your views on telecommunications since the AT&T breakup?" or "What do you think about advertisements aimed at children?" Here's how it just happened in real life.

Patricia Diaz Dennis, President Reagan's nominee for a seat on the FCC, arrived moments before the hearings were to begin. She walked in, accompanied by her husband and two children. Every seat in the room was filled except those reserved for the senators who would question her. Those seats were empty.

Shortly thereafter, Sen. Slade Gordon (R-Wash.) convened the hearing in the absence of Subcommittee Chairman Barry Goldwater (R-Ariz.). Dennis read a three-minute statement in which she said she would be "open-minded and impartial," and that she "looks forward to learning more about telecommunications." Gordon recessed the hearings.

Fifteen minutes later, Goldwater came in from another hearing. After a few jokes, he said he found nothing objectionable in Dennis' background and that the absent senators agreed. "You're in," Goldwater said to Dennis.

"That's it?" she asked.

"That's it."

Presumably she is a talented, intelligent and fair-minded woman. But Patricia Diaz Dennis — who handled labor law for ABC in Los Angeles for five years and who has been a member of the National Labor Relations Board since mid-1983 — has virtually no experience with communications. The lack of experience apparently did not bother President Reagan, who appointed her. Nor did it bother the senators who confirmed her. And it apparently did not bother Dennis, who discussed it quite candidly in her brief opening statement.

No one was bothered because this lack of experience is normal in FCC nominees. The so-called Reagan Revolution has left one aspect of government regulation very much unchanged: As in the past, more than half of all nominees are — like Dennis — lawyers with only minimal government experience.

Lawyers have always dominated communications regulation, with two exceptions: the regime of technical experts in the pre-FCC Federal Radio Commission, and the coterie of ex-New Deal regulators and former FCC staff members who, from 1939 to 1952, presided over what historians call the FCC's only "public service" period.

But in more recent years, the result of this emphasis on candidates without career backgrounds has been, according to one study, an FCC that sees issues in "legal and administrative rather than in social or economic terms."

Dennis will soon be asked to vote on issues like cable "must carry" and telephone costs. She says she is eager to learn. But who will teach her?

Her first instructors will be FCC staff specialists — very busy lawyers and engineers. Barry Cole, a former FCC consultant and author of *Reluctant Regulators: The FCC and the Broadcast Audience*, explains how it will work:

"No one will say, 'She's new, let's give her one side of the story.' But commissioners usually get briefed by the staff only on specific items. The staff can't step back to give the big picture. They'll give answers, but she won't know what to ask." By a kind of osmosis she may never recognize, Dennis will absorb the accepted wisdom.

One recent FCC member caught a lot of embarrassing publicity by saying that he'd learned by sitting at his desk and listening to the people who came in. When asked from whom she'll learn, Dennis says, "It's like you start out in any new job. I'll have to learn [how the system

See **Dennis** page 40

Swerdlow is the Washington Editor for Channels Magazine, *a New York-based publication that covers the broadcasting business.* *Copyright 1986*, Channels Magazine. *Reprinted by permission.*

NETWORK WORLD

Features

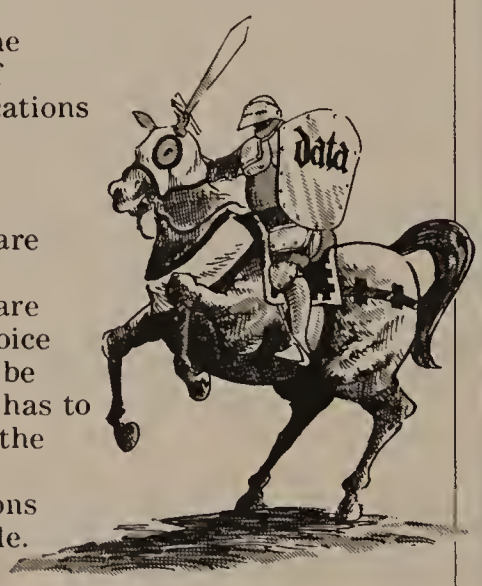
September 15, 1986

Jumping on the broadband wagon
Broadband local-area network applications abound, with video teleconferencing and factory automation jumping on the broadband wagon. Companies moving toward broadband local-area networks should plan them with an eye toward the future, however, lest they are forced to make expensive additions down the road.
This page.



Salty advice for T-1 shoppers
Before facing waves of hungry T-1 multiplexer vendors, prepare yourself with a definitive shopping list of your requirements. By quickly eliminating vendors that don't meet your basic needs, then scrutinizing the remaining competitors, you'll end up with a multiplexer that suits your requirements, not somebody else's.
Page one.

Dueling departments
Politics reign supreme in the integration of telecommunications and data processing. Although the technologies are merging, the departments are not. Before voice and data can be united, there has to be a truce in the corporate communications power struggle.
Page 35.





A new net goes Down Under
When Australia's Department of Social Security decided to upgrade its postal service-type IBM network, Big Blue was the dominant vendor for the Australian government sector. Two years and $125 million later, the only IBM products left are two mainframe operating systems.
Page 39.

Jumping on the broadband wagon

BY JOHN J. HUNTER
Contributing Writer

Broadband systems are analog systems that modulate data to radio frequencies before transmitting it. They use multiple channels that are determined by dividing the total available frequency spectrum bandwidth of the transmission medium backbone — usually cable television cable — through frequency-division multiplexing techniques.

Local-area networks are characterized by the number of frequencies used to handle input from various sources. Baseband systems transmit at only one frequency and speed, typically between 1M and 10M bit/sec, and use a time-division multiplexing technique to assign terminal devices a transmission slot on the transmission backbone network.

Individual frequencies are assigned to applications or classes of terminal devices according to their transmission needs. Messages are broadcast to all channels, but only those terminals that are tuned to the frequency can access the information.

Users can squeeze every last bit out of the frequency.

Individual broadband local-area network channels can be configured with data rates of several megabits and can transmit alongside channels carrying voice and video. Thus, several applications can simultaneously share the available bandwidth. The data applications, consisting of asynchronous and synchronous data packets, are typically transmitted at a higher level.

For offices, local-area networks must be able to connect personal computers and provide sophisticated software to support applications such as electronic mail and disk sharing. They must also be able to access mainframes and minicomputers for data processing and data base management functions.

Computer-aided engineering needs very high-speed throughput to handle applications such as graphics. Sophisticated interfacing software is also required. Although broadband networks have the bandwidth, products such as Ethernet have captured a large portion of this marketplace because of the availability of good networking software. Many broadband local net vendors — Applitek Corp., Contel Business Networks, Sytek, Inc., Ungermann-Bass, Inc. and Wang Laboratories, Inc. — provide interfaces to the Ethernet networks.

Video teleconferencing is another popular broadband local-area network application that involves transmitting voice and data simultaneously. Many video applications require between 3M and 6M Hz of bandwidth, or approximately 2M to 3M bit/sec, for high-quality, full-motion reproduction.

Digitized video is being used to reduce the bandwidth needed to attain high-resolution, full-motion transmission.

Experimental systems are now producing acceptable results with 56K bits.

Hunter is president of TMS Corp. in Devon, Pa.

LOCAL-AREA NETWORKS

Vendor	Model	Terminal interface	Maximum ports per terminal interface unit	Single cable maximum channels for transmission and receipt/ speed (bit/sec)	Dual cable maximum channels for transmission and receipt/ speed (bit/sec)	Data protocol	Local-area network access protocol	Gateways	Lowest cost per port
Allen-Bradley Co., Inc. Ann Arbor, Mich.	Vistalan/1	RS-232	32	5,5/2.5M	—	Asynchronous, synchronous	Token	—	$850
Applitek Corp. Wakefield, Mass.	Unilan	RS-232 RS-449	32	26,26/10M	59,59/10M	BSC, SDLC	CSMA/CD, Token	X.25	$490
Codex Corp. Mansfield, Mass.	4000 Series	RS-232	24	5,5/5M	—	Asynchronous	CSMA/CD	SNA/SDLC	$500
Concord Data Systems, Inc. Marlborough, Mass.	Token/net	RS-232 RS-422 RS-449	12	6,6/5M	—	Asynchronous, synchronous, BSC, SDLC	Token	X.25, MAP	$475
Contel Business Networks Bethesda, Md.	Contel 2000	RS-232 RS-422	4	2,2/2M	2,2/2M	Asynchronous, BSC	CSMA/CD	X.25	$937
Sytek, Inc. Mountain View, Calif.	System 2000 System 3000 System 6000 System 7000 Local net 20	RS-232 IBM 3270 PC IBM 3270 RS-232	32 16 1 16 32	60,60/128K 60,60/128K 1,1/2M 60,60/128K 40,40/128K	— — — — —	Asynchronous, *, PC, asynchronous, asynchronous	CSMA/CD CSMA/CD CSMA/CD CSMA/CD CSMA/CD	— — PC Net — —	$726 $1,000 $530 $687 $687
TRW, Inc. Information Networks Division Torrance, Calif.	Concept 2000	RS-232 RS-422	32	13,13/2M	13,13/2M	Asynchronous, synchronous, BSL, SDLC	CSMA/CD	X.25	$500
Ungermann-Bass Inc. Santa Clara, Calif.	Net/one	RS-232 RS-449 CCITT V.35	24	5,5/5M	—	Asynchronous, BSC, SDLC	CSMA/CD	X.25	$368
Wang Laboratories, Inc. Lowell, Mass.	Sims Cmux Wang PC	RS-232 IBM 3270 PC	8 32 1	4,4/5M 28,28/4M 4,4/5M	— — —	Asynchronous, **, PC	OSMA/CD CSMA/CD Token bus	— — Wang VS, PC Net	$400 $281 $800

PC Net = IBM PC Network
SDLC = Synchronous Data Link Control
SNA = Systems Network Architecture
BSC = Binary Synchronous Communication
CSMA/CD = carrier-sense multiple access with collision detection
* = IBM 3270 terminal code
** = Wang proprietary (HDLC-like) code
MAP = Manufacturing Automation Protocol

SOURCE: TMS CORP., DEVON, PA.

In the future, the greater availability and lower cost of coder/decoders and small cameras will allow users to conduct video sessions directly from their desks. It will also allow documents to be transmitted by merely scanning pages with these cameras. Compression Laboratories, Inc., for example, has developed a coder/decoder that transmits high-resolution, full-motion video in 750K bit/sec.

Factory automation is also a growing market segment, thanks to applications such as the Manufacturing Automation Protocol. Manufacturing operations require precise coordination of many moving units, and an access scheme to the local net must guarantee transmission in a short time frame. Token-passing systems are well-suited for this application because there are minimal delays when a terminal is accessing the network.

IBM's PC Network is conspicuously absent from this survey. The primary reason for the omission is that IBM has recently canceled its agreement with Sytek for local-area network cards for its Personal Computer and appears to be de-emphasizing broadband in favor of its baseband Token-Ring Network. Its PC Network capabilities are basically the same as Sytek's System 6000. The Sytek product, however, has more buffer capacity and faster internal speed, according to the vendor.

All broadband systems use radio frequency (RF) modems to modulate the inputs at the assigned frequency. These modems are split-frequency units tuned to transmit on one frequency and receive on another. Or, users can direct units, called frequency-agile modems, to transmit and receive on multiple frequencies. A frequency-translation device, located in the network's head end, translates the transmit frequencies into receive frequencies and routes data to the appropriate channels.

With fixed-frequency modems, the transmit and receive frequencies are established by the vendor at the time they are made, and they often require a factory adjustment to change them. Frequency-agile modems, on the other hand, can have their frequencies altered in the field to be compatible with the specified channels.

Frequency-agile modems are used to group certain terminals, hosts and gateways to send and receive information. These modems can allow the use of certain transmission channels that might otherwise be idle or can assign frequencies as new applications are added to the network. All of the vendors in this survey use fixed-frequency and frequency-agile RF modems in their interface units.

Users employ frequency-division multiplexing techniques much like those in the CATV industry to derive the individual 6 MHz transmission channels. Broadband communications can also use the same components, such as connectors, amplifiers and RF modems, and the same design aspects as CATV products. Those products, however, must meet the stringent design parameters of local-area networks.

Over the years, broadband manufacturers have established standards for components to make them interchangeable. Companies such as General Instrument Corp., South Hills Electronics Co., Western Digital Corp. and Anixter Brothers make these local-area network components.

Although components may be interchangeable, no standards for the operating frequencies of applications have been set.

Broadband local-area networks use a tree topology consisting of a backbone bus cable. Users attach their terminal devices to the cable via a terminal interface unit (TIU) that contains ports on the data terminal equipment side for handling terminals, printers, personal computers and so on. The TIU connects to an RF modem on the bus side. Most TIUs have many ports and accommodate the popular EIA interfaces such as RS-232-C, RS-442, RS-449 and CCITT interfaces such as V.35.

Because baseband local nets do not dedicate transmission slots, the total number of individual terminals that can be supported depends on the available bandwidth, the speed of individual terminals and the number of terminals simultaneously transmitting.

The RF modem is tuned to an assigned channel frequency to transmit and receive information. The

☞ Continued on page 34

From **page 33**
range of frequencies used and the number of channels derived differ from vendor to vendor. For example, several local nets use five 6-MHz channels for transmission and five for reception on a single-cable system.

Some vendors use much narrower channels to derive more of them. Sytek, for example, divides 6-MHz channels in subchannels, each capable of carrying 128K bit/sec. When evaluating vendors that offer more than five transmit and five receive channels, make sure that this can be done without using more than one frequency translator. If not, this will add a substantial cost to the overall network, depending on which frequency translator is used.

With most systems, the higher the transmission speed, the more bandwidth it will occupy. However, the amount of bandwidth needed also depends on the modem's bandwidth efficiency. The trade-off is that the more efficient modems cost more, and the advantages must be weighed in terms of applications and bandwidth. Networks that are fully loaded need all the bandwidth they can get. Therefore, it's a good idea to consider all future applications before ordering an RF modem.

Broadband transmission is unidirectional; therefore, various configurations are used for bidirectional transmission. One of the simplest solutions is to use a dual-cable system with one cable to transmit and one to receive. Such a configuration does not require the frequency translator to shift the transmit frequency to the receive frequency.

Other local-area networks achieve bidirectional transmission using a single cable and midsplit and subsplit techniques. Both techniques split the total bandwidth into a set of frequencies and assign some to transmit and some to receive. The midsplit technique assigns half the frequencies to one direction and half to the other. A guard band separates the division.

Some communications configurations use a large number of fixed user pairings, such as a direct connection of a terminal to a host. For applications such as these, users want the connection map to be established once and regenerated each time the system is restarted. This technique is called "fixed-frequency pairing."

When fixed pairing is not desired, the user must determine if the exchanges are of long duration or short duration. Long duration requires circuit-level support, and short duration requires datagram support. In either case, users must identify the called party, and the local net will connect to the specified destination when requested to do so.

All products in this survey have circuit-level support, and all but Sytek's System 2000, 3000 and 7000, and Wang's Cmux support datagram.

Products are also available that allow a 10M bit/sec Ethernet channel to be established on a broadband network and operate concurrently with broadband applications. Both Bridge Communications, Inc. and Chipcom Corp. offer products that will adapt broadband local nets to support the Ethernet channel.

When evaluating local net products, pay careful attention to vendor claims for Open Systems Interconnect (OSI) model implementation. Compatibility exists at the physical and link layers, but the other five OSI layers may be incompatible.

Local-area networks control access to the bus through contention or token passing.

Token-passing standards have been established by IEEE 802.4 for a bus local net using token passing, and 802.5 for a ring local net using token passing. These standards establish the ground rules for passing a token from terminal to terminal and for instituting recovery should a token be lost because of a system failure. A token is produced by a station when the network is started up and continues to circulate as long as the network operates.

The local net vendor or the user determines the number of bytes in a token. The token is passed among stations, and those with data to send remove the token, substitute their data and regenerate the token at the end of its message.

With token passing, there is never the chance of transmission collisions, as is the case with the other popular transmission method, carrier-sense multiple access (CSMA). CSMA is a contention protocol in which stations listen to the line for transmissions and seize the communication channel when they sense it is free. The most prominent weakness of this technique is that packets of user information often collide during simultaneous transmissions, and information is lost.

Some systems attempt to minimize the chance of collisions through a technique called "collision avoidance." This strategy calls for the station to listen for a time interval and then transmit the data. Of the products in this survey, only TRW, Inc. uses collision avoidance.

The alternative procedure is based on the statistical probability that a collision will not occur, but should it happen, there are procedures for recovery. This is called "collision detection."

CSMA broadband local nets with a low level of traffic or those less than three miles long have about the same level of performance as token-passing systems. When traffic or distance increases, CSMA systems have more collisions and less free cable time, and they generally degrade in performance.

Most local-area networks provide local sharable disks and printers and allow users to access them through "server" devices. The idea behind products like disk and printer servers is that it is more economical to provide centralized resources that all terminals can access than to equip each workstation with extensive disk storage and individual printers.

When implementing a broadband local net or adding new applications to an existing one, spend some time evaluating current and future applications. It will head off problems later on. "Some of the best advice you can give a company moving to broadband is to choose a vendor or consultant with experience in designing the cable plan," says Ralph Rio, local-area network product manager for Codex Corp.

The cable plan is the overall topology of the network and includes the backbone cable plus branches to user locations. A carefully designed plan anticipates future locations and the impact they will have on local net performance.

"Adding taps might require changing amplifiers, and that could distort the signal level," Rio cautions, "therefore, it's better to put line taps wherever you think they'll be needed when the cable is installed."

A drawback of broadband local-area networks is the lack of standards governing the frequencies assigned to applications. This can result in transmission problems if frequencies should overlap. "That's a large problem," says Skip Addison, a local-area network product manager for Ungermann-Bass. "It requires careful coordination among users groups."

For users with frequency-agile modems, such overlaps are only a temporary inconvenience. Frequency overlaps are avoided with a good frequency plan and are resolved by changing the modem's transmit/receive frequencies. With fixed-frequency modems, however, they must be packed off to the factory for recalibration, unless there is a way to change frequencies in the field. Users planning to purchase modems and frequency translators from third-party vendors should be sure the frequencies the vendors assign are compatible with the applications.

The RF modem is also the source of another problem, adjacent channel noise caused by harmonic distortions. "Poorly designed RF modem filters cause bleeding over to other channels," states Rio, "so be sure to check the signal-to-noise ratio to determine the effect on other channels."

John Ambler, vice-president of local-area network systems for Contel, agrees. "Harmonic distortions can be a major problem, and one way to avoid them is to use a modem with a noise level that is from -30 to -50 db below the signal being transmitted."

Careful application planning can't be emphasized enough, according to Jerry McDonald, director of marketing for Applitek. "Just about every initial broadband local-area network user underestimates the demands that future applications will place on the network," McDonald says. "With the tremendous bandwidth available and the ease in which applications can be added, users keep expanding applications and suddenly find the network swamped. They are then faced with the prospect of making expensive additions to the network."

Sytek Systems 3000 and 7000 are designed to interface IBM 3270 terminals to the broadband network. The major difference between those local nets is that the System 3000 provides protocol conversion that permits an asynchronous terminal to emulate an IBM 327X terminal, and a protocol converter that allows those IBM terminals to emulate an asynchronous terminal and communicate with Ascii host processors.

The System 7000 offers no protocol conversion services. Applitek and Ungermann-Bass also offer protocol conversion cards that allow 3270 terminal emulation. The Contel Series 2000 comes with an X.25 facility, which accounts for the relatively high cost per port.

The Sytek System 6000 and Wang PC are intended to link personal computers with the broadband network by placing an interface card into the PC and by allowing bus-level transfers directly to the local net. Both of these products will also connect to IBM's PC Network.

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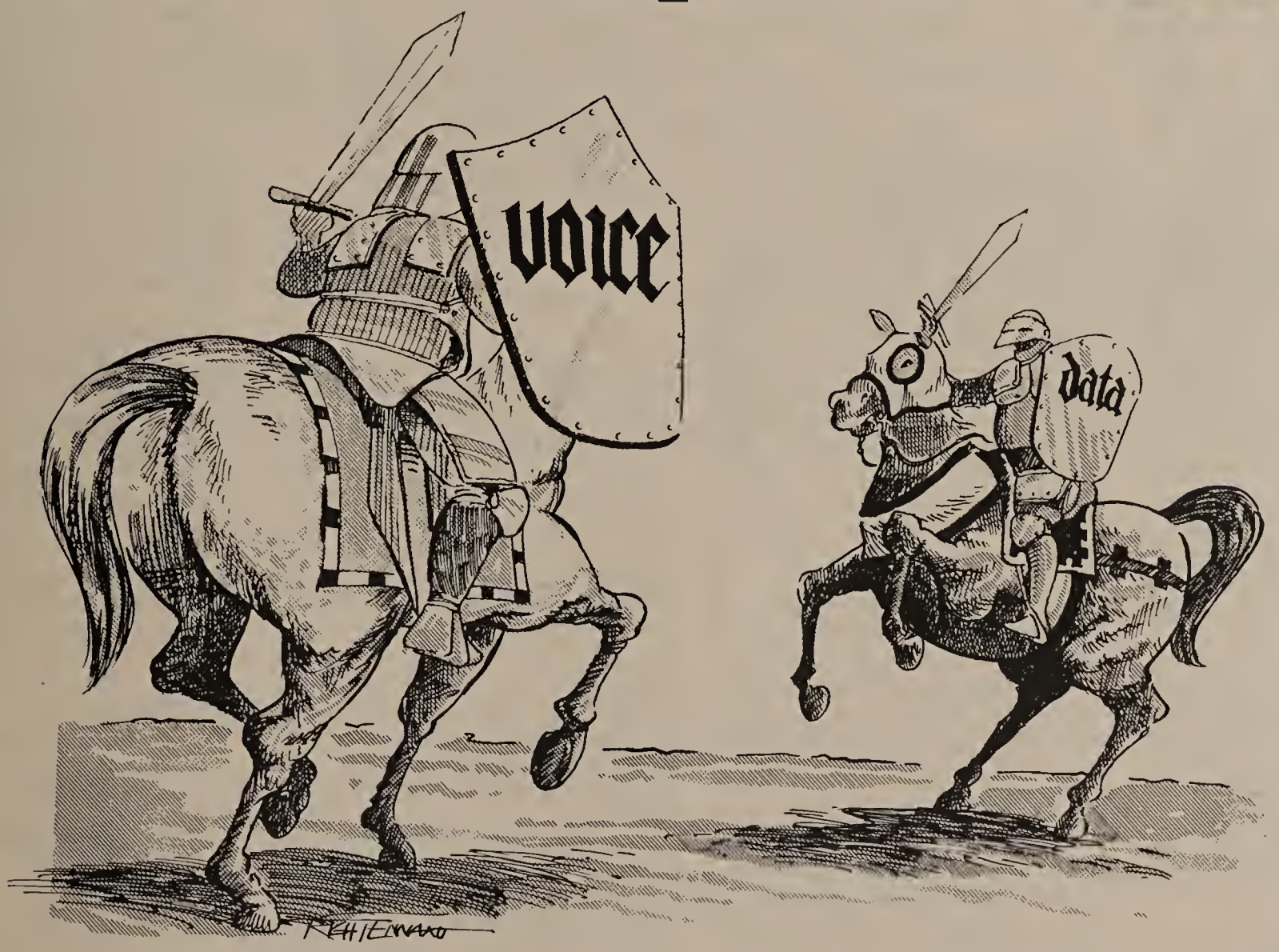
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▶ VOICE/DATA INTEGRATION

Dueling departments



Who will be the victor in the voice/data struggle?

BY JULIA KING
Special to Network World

Despite all the talk about the integrating voice and data, very few users have taken great strides toward merging the two technologies. One reason is that there is no single, straightforward and inexpensive method for integrating them.

A second and perhaps even greater stumbling block is that few, if any, corporations are organized to accommodate such a merger peacefully.

At most user sites, voice and data departments remain separate and distinguishable fiefdoms lorded over by managers intent on retaining their current responsibilities and power.

King is a free-lance writer based in Woodhaven, N.Y.

As Jim Greenway, a Northern Telecom, Inc. product marketing manager for data services, points out, "Companies just aren't organized right now to build [integrated voice/data] networks."

An informal survey of more than a dozen users bears out Greenway's observation. At most companies, telecommunications managers are exclusively responsible for voice communications, while MIS managers take charge of data processing operations and data communications. In most cases, the two departments maintain separate budgets and report to different higher-ups on the corporate ladder.

In other words, communication between the two departments as well as joint planning and purchasing are minimal. This remains the case despite the enormous savings that could be realized by combining certain parts of the two operations.

Take, for example, the situation at Orion Group, Inc., a national insurance firm headquartered in Farmington, Conn.

Voice services at Orion come under the auspices of the company's director of building services, who, in addition to telecommunications, is responsible for the acquisition of office furniture and the maintenance of company real estate.

The primary functions of the department are real estate and furniture, with telecommunications tacked on as a building service. Data communications, on the other hand, comes under the company's DP department.

Currently, Orion's DP department operates a triangle of point-to-point 56K bit/sec circuits between Farmington and two other

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major nodes in Dallas and San Jose, Calif. The circuits are data-only links, even though the firm could gain a substantial savings by replacing the 56K circuits with T-1 links that could more than adequately accommodate both voice and data.

"I could cost-justify a voice/data network if I had the organizational responsibility to direct that kind of planning," says Mike Monahan, manager of the company's network control center in Farmington. "But I'm stymied because voice is a different department.

"If I had access to voice and Wats bills, I could justify T-1 or at least more 56K links," he adds, noting, "That would be the beginning of voice/data convergence."

But as Monahan sees it, the only option currently open to him is to "start my own internal politicking to get the voice side on my data side of the house." This, however, is dangerous because "if I take over voice, there would be resentment on the voice side. It's a delicate and awkward situation," he adds. "It's also like dancing on ice because you don't know if the other person will resent your overture and perceive it as a takeover bid, even though it would be for the good of the company. That's the problem when you don't have functional responsibility."

Managers for the state of Utah are faced with a similar situation, according to Brett Helm, a telecommunications network supervisor. Helm's telecommunications department handles all voice communications for the state government.

There, responsibilities for voice and data communications are sharply divided between a telecommunications department and the DP department. According to Helm, they will probably remain that way chiefly for political reasons.

> *"Rigid organizational structure is not the only factor stalling the merger of the two technologies."*

"When you combine services, you have got two people at the top, and neither one of them wants to take a backseat," he observes. Meanwhile, he adds, "It's not really cost-effective to run two services."

Although rigidly structured hierarchical organizations have stymied the integration of voice and data at most user sites, many companies do incorporate data communications into their DP departments. In Utah, for example, Helm's telecommunications department orders transmission capacity from outside vendors, and data communications managers in the DP department must request bandwidth from the voice side of the house. Responsibility for data communications comes under the DP department, but it remains separate and distinct from the telecommunications department.

> *"Although rigidly structured hierarchies have stymied the integration of voice and data at most user sites, many companies incorporate data communications into their DP departments."*

Similarly, at the Mine Safety Appliances Co. in Pittsburgh, data communications comes under the bailiwick of the DP department.

"The merger in this case really involves data processing operations and data communications," says Dennis Upton, the company's director of MIS.

Upton also notes, however, that Mine Safety has taken at least one step toward the integration of voice and data by setting up what he describes as an office automation council. Members of the council include voice and data personnel who meet every other week to make each other aware of their separate disciplines and strategies.

In addition, all recommendations for the acquisition of customer premises equipment are made by the office automation council after receiving input from both voice and DP personnel. Still, these two sides of the house maintain separate budgets and report to different offices in the corporation. The MIS department reports to the company's financial officer, while the telecommunications side remains lumped together with other administrative functions — including the acquisition of supplies and management of real estate — and reports to the company's department of personnel administration.

Rigid organizational structure and the dearth of affordable integrated voice/data equipment are not the only factors stalling the merger of the two technologies, however.

A third obstacle is the historical dominance of corporate DP departments and the influence and pressure they can exert in their efforts to remain autonomous. Even more problematic is the myopic view DP departments can frequently take in defining an organization's communications needs.

"When it comes to defining service offerings, it's pretty clear that MIS is talking about central site computers, terminals and data administration services," says Fred Forss, director of corporate telecommunications for Northwestern National Life Insurance Co. in Minneapolis. "Telecom usually gets defined as being outside of data."

Furthermore, Forss notes that DP managers have a tendency to regard end users only as those people in departments that are subsets of their own. These would include programmers and systems analysts and exclude those who Forss describes as the "real end users," or "people with both a telephone and a terminal on their desks."

As a result, he adds, voice communications tends to get excluded.

One way around this stumbling block is cross-training telecommunications and DP managers. But, users report that this solution has not been widely implemented because the strict structure of their companies hampers communications across departmental lines.

Second, managers say, there simply isn't the time for something like cross-training, which is not a top priority at most companies. The emphasis seems to be on computer-to-computer communications, and DP seems to have a handle on that already.

Some users, however, report that they have participated in what one telecommunications manager euphemistically referred to as "informal cross-education sessions." Generally, he says, these involve collaring his DP counterpart on the way to the cafeteria and chatting about what each other is doing.

Although it appears that the majority of corporations have done little or no structural reorganization around the convergence of voice and data, there are a handful of user sites where changes have been made. One of these is the city of Fort Collins, Colo., which has incorporated telecommunications, DP and cable TV communications functions into a newly established department of Information and Communications Systems (ICS).

According to Marsiea Dahlgren, director of ICS, the department's creation followed the installation of a Northern Telecom SL-1 private branch exchange, which is switching both voice and data, and is processing office automation applications as well.

Because the two functions were being combined on a technical level, the city decided to integrate managerial responsibilities also. The result is what she describes as a "team management concept," which involves "trying to match talents to tasks." In other words, someone who responds well to end users would fulfill that role in the new organization, no matter what his responsibilities were in his original department.

Dahlgren also notes that the city realized early on that the introduction of office automation and the installation of the voice/data switch would necessitate a radical change in organizational structure.

Prior to the installation of the switch, telecommunications responsibilities in the city came under a general services department that was not equipped to take on the additional responsibility of a full-blown office automation implementation. Similarly, the DP department was ruled out as a candidate because "traditional DP types can't usually take on user-interaction functions," Dahlgren notes.

"We had a traditional DP department, and traditional DP departments aren't accustomed to dealing with real end users," she says. "They don't have the customer bias that's required; they're used to existing for the sake of existing."

Dahlgren concedes that the creation of ICS did ruffle a few feathers in the DP department. She adds that the overall transition, however, went relatively smoothly because city officials knew enough to involve the DP department in its strategic plans from the start. This is something she recommends for other companies considering organizational changes as a means of integrating voice and data.

Another helpful tip Dahlgren offers is that organizations hire a generalist to head up any newly created department handling voice and data. This is because generalists are better able to deal with user issues because their knowledge is not concentrated in one area, like that of a DP professional. The hiring of a generalist can also help head off turf wars between the voice and DP departments.

> *"One way around the stumbling block is cross-training telecom and DP managers."*

Finally, Dahlgren highly recommends that organizations trying to integrate voice and data functions regard voice communications as "another tool of automation," rather than as an entity unto itself.

Taking these steps may indeed help companies achieve voice/data integration more quickly, but first, it appears that most companies have some fine-tuning to do when it comes to establishing a corporate pecking order able to accommodate a merger of the two technologies. Until this happens, technology will continue to outpace companies' ability to use it most effectively.

FEATURE FOCUS

Salty advice for T-1 shoppers (part 2)


JON MCINTOSH

Don't get swamped by bad vendor advice.

Continued from page 1

Each user's criteria should be weighted according to the results of the requirements analysis discussed in the first part of this series ("Salty advice for T-1 shoppers," *Network World*, Sept. 1). The process of weighing these criteria is dependent on user requirements and varies widely from user to user. In a network based on AT&T T-1 lines, for example, synchronization capabilities will not be as important as they would be in a network with mixed satellite, Dataphone Digital Service and terrestrial facilities.When choosing a T-1 multiplexer, the user should keep several key considerations in mind.

Internal structure

The multiplexer's hardware architecture, or internal structure, includes the channel and shelf structure, the internal multiplexing and switching structure and bus speeds and is characterized by modularity of the system. The user should be sure to evaluate the modularity and flexibility of the multiplexer, as well as any fundamental limitations in the maximum number of nodes, cards, shelves and channels that can be supported.

Nesmith is a consultant with Network Strategies, Inc. in Fairfax, Va.

It's also important to identify the method of communications within a shelf, whether it is from one shelf to another or from one switch to another. Also, the user should check whether each card can be controlled by dip switches on the card or through a terminal control system. Some multiplexers require firmware as well as software upgrades.

Other criteria include the level of redundancy, blocking probability, interchangeability of card slots, meantime between failures and meantime to repair. Many multiplexers have an integral channel service unit (CSU) that is required when transmitting over AT&T or local telephone company facilities.

A T-1 multiplexer's software architecture is closely related to its control system. Software architectures that are based on standard programming languages and that utilize standard products are far superior to multiplexers that use proprietary software.

Software written in a standard language is easier to customize, and users have more choice when augmenting the multiplexer with data base, inventory control or other applications programs.

Other considerations include the frequency of software upgrades, upgrade compatibility with earlier releases and the method of deploying upgrades in the network. Software architectures that require the multiplexer to be shut down for upgrades are not as flexible as architectures that enable upgrades while the system is up.

Network management

Network management falls into three categories: network monitoring, network testing and network control.

As part of its normal operation, the multiplexer should allow the user to define the conditions under which alarms will be sounded. Network monitoring ensures that a network control center is aware of abnormal conditions.

Other statistical information can be gathered on the quality of the network, particular links and link error rates as well as the quality of individual channels on the links. Additional reports on configurations should be stored and made available on request.

During abnormal conditions, the network control center must be able to test the network. The multiplexer should be able to run diagnostics on cards, nodes and links.

More sophisticated network testing allows the user to run local and remote loop-backs and to test both aggregate and individual channels. To assist in network diagnostics, the multiplexer should have LEDs on nodes, shelves, cards and ports.

The user should decide whether the network should be managed from a single point or from multiple points. If there will be multiple

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points of control, the user should determine the method of limiting access to the network management system. Nodes should be controllable from a single point and should have adequate storage capacity for network statistics.

Ultimately, the network control center must have power over the network configuration.

Network control systems that are compatible with other products are especially valuable in controlling a multinode network from a single point.

Networking capabilities

Some multiplexers have sophisticated capabilities for dynamic reconfiguration. Switching multiplexers typically have this feature.

These multiplexers usually communicate between nodes via a common channel signaling link, which can be used to allocate bandwidth and to determine channel routing. Circuits are automatically rerouted during failures without the use of routing tables, and the multiplexer dynamically balances traffic to ensure that all T-1 circuits are equally loaded.

The method of controlling routing should be determined, whether it is by individual channel, at the DS0 (64K bit/sec) channel level or by groups of channels. Priority and preemption levels can be defined and virtual circuits constrained to take specific paths.

Most multiplexers, however, do not use dynamic reconfiguration. Instead they use routing tables that the user must predefine to control network configuration.

This requires a significant upfront effort since the user must create all the tables before they are needed.

Users should know how network configurations are loaded and changed and how long rerouting takes. They should also take note of the maximum number of nodes, T-1 lines, channels, network maps, possible routes and priority and preemption levels.

Meeting the requirements

Multiplexers should meet all relevant North American interface standard requirements, such as AT&T Accunet compatibility, Digital Access and Crossconnect System compatibility, and channel bank interface compatibility.

In addition, a multiplexer should support aggregate V.35 and RS-449 interfaces, and for international applications, the E-1 (European 2.048M bit/sec) interface should be supported.

The multiplexer should have the flexibility to support emerging Integrated Services Digital Network standards such as common channel signaling, extended superframe and Bipolar Eight Zero Substitution, an industry standard for providing clear channel capability.

The user should also check the multiplexer's link efficiency. Some units take up to 200K bit/sec for overhead and processing.

Many T-1 multiplexers can transmit at several speeds. Some support data rates up to T-2 speeds (6.3M bit/sec), while others may have multiple aggregate interface speeds, adjustable from half the T-1 rate to T-2.

A good T-1 multiplexer should also support many types of voice interfaces and signaling methods, such as D4 channel bank interfaces, four-wire E&M, foreign exchange, off-premise extension, automatic ring down, adaptive differential pulse code modulation and continuously variable slope delta modulation.

Sophisticated products may support advanced voice compression algorithms, such as digital speech interpolation or low bit-rate voice. The ability to adjust decibel loss through the multiplexer is extremely useful for voice networking.

Multiplexers should also support all major types of data channels, including RS-232, V.35 and RS-449. The interface should have adjustable male/female adaptors to support both data terminal equipment and data communications equipment. One critical factor for supporting RS-232 interfaces is the number and type of pins the multiplexer can transmit. If the user has a modem-based diagnostic system on one of the tail circuits, network management information is usually passed through on a secondary signaling lead.

If that information is not transmitted back to the master modem, the advantages of having a modem-based diagnostic system are lost. Ultimately, the user must examine the flexibility of the data interfaces, including the speeds and signaling that are supported.

Other types of interfaces that may be useful include X.21, X.25, X.3, X.28 as well as X.29. These Consultative Committee on International Telephony and Telegraphy standards define a variety of interfaces for packet switching networks.

In addition, the user may want to evaluate support for International Electronics and Electrical Engineers local-area network standards 802.3, 802.4 and 802.5.

Also, the multiplexer should be certified to work with particular private branch exchange or coder/decoder vendors. A lack of certification could point to potential problems.

Multiplexer delay can significantly affect voice performance; therefore, no end-to-end delay should exceed 50 msec. Any greater delay probably requires the use of echo cancellation equipment for voice channels.

During normal operation, most multiplexers work well. During abnormal conditions, such as when there is a link failure, a channel should usually maintain its state long enough for the multiplexers to reconfigure the network. If the multiplexers are unable to do so, the channel should indicate link failure.

For example, the IBM 3725 requires that the data set ready (DSR) pin on the RS-232 interface be maintained in an active state. If that state is not maintained, the operator must reinitiate the session.

During network reconfigurations, the channel should maintain the DSR signal for 3725s to keep sessions from being terminated.

Synchronization

A multinode network may have multiple clocking sources, so synchronization is a critical issue — especially when sources are satellite based.

Most multiplexers use a hierarchical synchronization plan for each node, but such a plan becomes complicated in a multinode network.

The user must, therefore, ensure that the best clock is used and that synchronization reference is never exchanged between nodes in such a way that a loop forms.

In a loop, voice and data channels experience increasingly high error rates until the nodes reset themselves and the cycle of increasing errors repeats. This makes loop synchronization problems difficult to identify. Most multiplexers use buffers to support clocks that cannot be synchronized to the master clock. The size of the buffer and the method for controlling frame loss are the critical factors here.

Some multiplexers use a capability called super sampling or pulse stuffing to handle tail circuits that are not synchronized to the operating clock.

The multiplexer allocates extra bandwidth and inserts dummy bits around the lower speed channel to handle the channel's different clock source.

In a large network with satellite facilities, or T-1 facilities that receive timing from multiple sources, the multiplexer must support multiple master clocks.

Satellites and AT&T Accunet facilities act as master clocks, so if a multiplexer terminates a satellite T-1 and an AT&T T-1 link, the multiplexer must fool each link into reacting as if it is the master clock. When the network does not receive timing from a transmission facility, the multiplexer must provide it.

Vendor service and support

The level of vendor service and support depends on a variety of factors. Among these are the proximity of service centers, the availability of the help desk, the quality of service personnel, the types of service contracts available, the vendor help center's level of sophistication and the availability of parts.

In addition, the user should research the track record of each vendor.

Vendors offer different escalation procedures, which determine how quickly and at what level user problems are handled.

Users should check how quickly an unresolved problem moves up to more qualified vendor personnel. Finally, the user should check vendor references for product and service reliability.

Implementation plan

As part of a proposal, the user should require that the vendor specify an implementation plan for installation. This plan determines when the vendor is to be paid and when the user can expect the network to be operational. For critical applications, it is useful to have penalty clauses for late installations.

The user should evaluate the implementation plan for its level of detail, testing procedures for equipment, acceptance tests, contingency plans in case of failures and installation times. In addition, many vendors will provide design assistance as part of the implementation plan.

One of the more valuable resources for alleviating problems before they start and for making implementation easier is the vendor's training and documentation.

At a minimum, companies should provide an operator's guide, a hardware description and an installation manual. By requesting the manual at this time, users can evaluate its quality as well as the complexity of operating the multiplexer.

Some companies offer extensive training courses, and users may be able to negotiate training for a lower price by including it as part of the request for proposal process. Many vendors are willing to provide free training with the product.

Vendor stability

No user wants to invest in a product when the company supplying the product is in danger of going out of business. Users should investigate the prospective company's financial stability.

The relationship of the multiplexer vendor to its parent company as well as the total sales, earnings and number of years in telecommunications should be checked.

Users may also want to identify parts distribution locations and the location of manufacturing facilities.

In addition to stability, the depth of a vendor's product line may weigh heavily for some users. A vendor with a complete product line, such as PBXs or low-speed multiplexers, offers users the advantage of one-stop service.

Users could then control these products through a single network management system. This capability is extremely valuable in complicated networks.

Hidden costs

Finally, users should consider products in terms of their total cost, rather than simply comparing one multiplexer with another. Some solutions will require added maintenance, increased training or a large number of personnel to operate the network; therefore, comparing on product price alone is often misleading.

Many evaluations will lead to several multiplexers that appear equal in most categories.

If the differences are in critical categories, the decision may be complete.

If the differences are unimportant, the user should select the cheapest multiplexer by requesting a final bid from the remaining vendors.



▶SNA NETWORKING

A new net goes Down Under

Australia may have the world's largest non-IBM SNA network.

BY PAUL KORZENIOWSKI
Senior Editor

CANBERRA, Australia — The term "Systems Network Architecture" tends to be lumped with the letters I—B—M, which, in turn, conjure up pictures of hardware.

However, that is not the case at the Australian Department of Social Security. The government agency may now be running the world's largest SNA network without IBM hardware.

In 1981, the DSS decided to upgrade its IBM hardware and the post office-type network that supported it. Two years later, an evaluation process was completed, and $125 million worth of equipment was selected. After the choices were made, the only IBM products remaining were mainframe operating systems.

Each year, the DSS makes about 30 million social security payments to four million Australian citizens, an impressive number in a country with a population of 16 million. Those checks are worth $16 billion and represent approximately 10% of the country's gross national product and 28% of the government's total cash outlay. More than 16,000 people are needed to keep the DSS operating.

Although the department is the functional equivalent of the U.S. Department of Social Security, there are some differences between the two systems. The Australian system is not funded by employees but by employers, and benefits are given on a needs basis rather than automatically upon retirement. Also, the Australian agency issues its own checks, whereas the U.S. Department of the Treasury issues U.S. Social Security checks.

Processing problems

In 1981, the Australian DSS found itself at a crossroads: Its computer system and network were woefully out of date. Processing a check took about two weeks.

"We were having trouble meeting our payment dates and in some instances, missed some payments," says Noel Tanzer, deputy secretary and No. 2 honcho at the DSS.

The agency had been sharing

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IBM 370/158 mainframes run by other government agencies, which were located in five of the six Australian state capitals.

More than 210 regional DSS offices were capturing data and storing it on various types of magnetic tapes.

The agencies used postal services, one of the more primitive types of networks, to move the tapes from the regional offices to the state capitals. Using Remote Job Entry protocols, the regional offices ran a variety of batch processing jobs and processed the department's checks.

In addition to the processing problems, the old system was an administrative nightmare. The batch jobs produced microfiche client files, which were difficult to file and reference.

"Workers experienced many problems just trying to get simple client data," Tanzer notes.

A search for a more efficient means of processing the checks was undertaken and dubbed "Stratplan," which stands for Strategic Automated Data Processing Plan.

"The key to the plan was that top management was involved with the project right from its inception," Tanzer says.

The deputy secretary's background clearly backs up this claim. Tanzer played a key role in the evaluation process, despite the fact that he does not have a data processing or networking background. "I managed work flow procedures and searched for ways to make people more productive," he adds.

Selecting the system

Once the agency decided to upgrade its equipment, an executive committee was assigned to determine the department's present and future needs.

Because management personnel were involved, a comprehensive list of needs was developed.

At the end of 1981, requests for proposal were sent out to key manufacturers.

Six months later, vendors returned their responses to the agency. Almost a full year was needed to evalute the proposals, which were divided into four key components.

First, mainframes were needed to support bulk processing done at the state capitals and Canberra, the nation's capital.

Second, peripherals were needed to store data. Third, the DSS needed office systems to handle the office workloads. And last, a data base package was needed to replace the microfiche filing system.

The list of possible choices was pared to two competitors and three components.

A DSS evaluation team journeyed to California, where benchmark tests were run. Amdahl Corp. mainframes beat those of National Advanced System, Inc., while Wang Laboratories, Inc. VS systems defeated IBM Displaywriters. Computer Corp. of America's (CCA) Model 204 data base bettered Cullinet's Integrated Data Base Management System.

Storage Technologies, Inc.'s peripheral equipment was the only peripheral contender.

"We ran all possible combinations to ensure that we were selecting the proper equipment," Tanzer says.

Tanzer says that IBM did not submit a mainframe proposal. In the 1970s, IBM held a stranglehold on the Australian government sector, similar to the grip it currently holds on the U.S. commercial market.

But IBM's Australian grip began to loosen in the 1980s, despite the fact that the company recently was awarded some substantial contracts.

In March 1983, Stratplan was accepted. Since then, the government agency has been gradually phasing out the old equipment and putting new equipment in various offices. Amdahl 580 series mainframes and 4705 front-end processors were approved for Canberra and the six state capital installations.

The Amdahl systems are connected to the central processing facility in Canberra by 48K bit/sec lines, supplied by the government-run telephone company. The mainframes run either IBM's MVS or VM/SP operating systems.

Close to 300 Wang minicomputers were ordered for the regional offices. The Wang computers are connected to Amdahl hosts by 9.6K bit/sec digital lines, also supplied by the government telephone company.

The Wang systems access the CCA data base through IBM 3270 terminal emulation.

The network has been designed so that any terminal can access any application on the network.

The DSS uses Wang's Distributed Management Facility to supply the needed SNA communications facilities.

Limited lines

Tanzer says he would like to upgrade the network with higher speed digital lines, but he has no choice. "Basically, we have to take whatever the government telephone company decides to give us," he says.

Telecommunications in Australia is very different than it is in the U.S. Australia has rough terrain and a desert climate.

Much of the country has not been wired for basic telephone service, let alone high-speed digital communications.

In addition to high-speed lines, Tanzer says he would like a few other network amenities. "A major problem for us is distributing changes to the various Wang systems," he says.

Whenever a change is made, each system has to be individually altered. Tanzer says he would like to be able to distribute changes from a central site; the DSS is working with Wang to supply this capability. Another planned upgrade is support for IBM's LU 6.2 protocol. protocol.

Added software capabilities are among a number of items the DSS has to include before the network is completed. Tanzer says that approximately two-thirds of the regional offices have been connected to the network.

"We probably would be finished, but a number of offices were added after we completed the initial proposal," he says, adding that all offices should be on the network by year end.

The department would like to migrate all of its mainframes to IBM's MVS/XA operating system. This priority is also expected to be completed by year end.

Despite the few unfinished tasks, Tanzer says Stratplan's implementation has been very successful.

"We've cut our processing time from 14 days to three days," he concludes.

"That is the ultimate measure of the success or failure of this type of system."

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works]. I'm not sure how it will be done, but I guess briefings, talking with career people . . . and there are all kinds of public documents."

The solution is not to establish a better educational process. It is to make the appointment process more meaningful.

A 1976 Senate study concluded that any potential FCC commissioner who has been active on a major communications issue simply gets blackballed.

As Cole puts it, "If you're going to get someone who no one's opposed to, you're going to get someone who knows nothing about communications."

Change may be coming. The FCC used to be the second choice of people who could not get a better political appointment. Now it is a choice assignment, not least because every ex-commissioner has a guaranteed lucrative career as a Washington insider.

At present, relatively young people with little record and excellent congressional connections are getting these prime FCC jobs. But the time may come when the White House — no matter who occupies it — will consider an FCC appointment important enough to justify a tough confirmation fight.

If this happens, some people will be unhappy, but how many people are really happy with the way things are done now?

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throughout the city and uses PPSN to improve the cost-efficiency of data communications within the school district.

The University of Louisville, in Louisville, Ky., has joined South Central Bell for a trial of Pulselink, BellSouth Corp.'s public packet-switched service offering. This is the first application of Pulselink in the five-state South Central Bell territory. South Central's sister company, Southern Bell Telephone and Telegraph Co., has had a much higher profile with Pulselink as a result of its involvement with Knight-Ridder Software Co.'s Viewtron videotex experiment in Miami.

The University of Louisville trial starts in December and runs through June 1987. The initial application is to provide cost-effective access to the university's computer to students and other users throughout the metropolitan area. Currently, some 600 workstations are linked by cable to the university's network. Anyone else who wants to gain access must use a modem, and only a few people can connect to the system via modem at the same time. With packet switching, a line is not tied up by one terminal, so data packets coming from many different terminals can be sent over the same line simultaneously.

In Lincoln, Neb., the University of Nebraska uses Prairielink to provide terminal users with access to four host computers at its main campus. Originally built for Lincoln Telephone and Telegraph Co.'s internal data communications, this statewide data network is unique in combining packet switching and data-over-voice technologies. Prairielink also supports book reservation and electronic mailbox systems for the Nebraska Library Commission and connects a cable television company's branch offices to its headquarters.

POS terminal applications are well-suited to packet switching, yet they have thus far failed to attract merchants or banks. Only one bank is currently investigating this application. In October 1985, Pittsburgh-based Mellon Bank, which handles credit card authorizations for about 12,000 merchants in Pennsylvania and Delaware, began testing Bell of Pennsylvania's packet network for POS credit authorizations. The trial, which is still under way, involves 220 merchants in Philadelphia, Allentown, Pa., and Wilmington, Del., and is testing the feasibility of using a packet network instead of Inwats or Message Telephone Service (MTS) to link POS terminal users in Eastern Pennsylvania and Delaware. In May, Southern New England Telephone followed Bell of Pennsylvania's lead by announcing the future deployment of POS ports on its ConnNet packet network.

In the corporate market, Southern New England Telephone and New Jersey Bell have projects under way. In Hartford, Conn., Traveler Insurance Corp. is involved in a work-at-home experiment with employees accessing corporate host computers via Tymnet. In New Jersey, First New Jersey National Bank uses New Jersey Bell's packet network to perform Binary Synchronous Communications polling of its branch offices.

What is apparent in this brief review of existing customers is that the types of users and applications currently available via local packet networks are no different from those of national value-added networks. The lower hourly rates and ubiquity of switch deployment have yet to drive local packet switching beyond the basic business of value-added networks.

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

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1 My primary areas of activity. Circle ONE only.
I am involved in evaluating communications (data, voice and /or image) products and services:
1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both

1a For communications, my primary responsibility is: Circle ONE only.
1. Data Communications
2. Voice Communications
3. Both

2 Circle only the ONE title classification which most applies to you.

Company Management
11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CIO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management
Data Communications
21. Management
VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff
Supervisor, Head : Networking, Design, Analysis, Engineering, R&D, Applications, Services
Telecommunications
31. Management
VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff
Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services
Factory Communications
41. Management
42. Supervisory/Staff

MIS/Data Processing
51. Management
VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of System Design, Analysis, Applications

Others
75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other _____

3 Job Function
Which one of the following best describes your functional involvement with communications (data, voice, and/or video) products? Circle ONE only.

Corporate
1. Business Management, Planning and/or Development

Communications System/Network
2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other _____

4 Which one of the following best describes the primary business activity of your organization at this location? Circle ONE only.

Consultants
11. DP/Communications Consulting Services
12. Consulting Services (except DP/Communications)

End Users
13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/Construction/Petroleum Refining/Agriculture/Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors
41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, Intern'l Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other _____

5 In which ways do you typically become involved in acquiring communications products (data, voice, and/or video) and services? Circle ALL that apply.
1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 Check ALL that apply in columns A and B.
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

A	B	*Product/Services*
		Computers
☐	☐	01. Micros
☐	☐	02. Minis
☐	☐	03. Mainframes
		Data Communications
☐	☐	04. Communications Processors
☐	☐	05. Comm./Networks Software
☐	☐	06. Digital Switching Equipment
☐	☐	07. Facsimile
☐	☐	08. Modems
☐	☐	09. Multiplexers
☐	☐	10. Protocol Converters
☐	☐	11. Network Mgmt. & Control
☐	☐	12. Test Equipment
☐	☐	13. 3270 Controllers
		Telecommunications
☐	☐	14. PBXs
☐	☐	15. Key Systems
☐	☐	16. Central Office Equipment
☐	☐	17. Integrated Voice/Data Terminals

A	B	*Product/Services*
		Transmission/Network Services Equipment
☐	☐	18. Microwave
☐	☐	19. Satellite Earth Stations
☐	☐	20. Local Area Networks
☐	☐	21. Wide Area Networks
☐	☐	22. Packet Switching Equipment
☐	☐	23. Fiber Optic Equipment
		Communications Services
☐	☐	24. Packet Switching Services
☐	☐	25. Cellular Mobile Radio Services
☐	☐	26. Electronic Mail
☐	☐	27. Enhanced Services
☐	☐	28. Centrex

7 Estimated value of communications systems, equipment and services:
A. which you helped specify, recommend or approve in *last* 12 months? Check only ONE in column A.
B. which you plan to specify, recommend or approve in *next* 12 months? Check only ONE in column B.

A	B		A	B	
☐	☐	1. Over 10 million	☐	☐	6. $100,000-250,000
☐	☐	2. $5-10 million	☐	☐	7. $50,000-100,000
☐	☐	3. $1-5 million	☐	☐	8. Under 50,000
☐	☐	4. $500,000-1 million	☐	☐	9. Don't know
☐	☐	5. $250,000-500,000			

8 Estimated gross annual revenues for your entire company/institution:
Circle only ONE.
1. Over $1 billion
2. $100 million to $1 billion
3. $5 million to $100 million
4. Under $5 million

9 Estimated number of total employees at this location:
Circle only ONE.
1. Over 5,000
2. 1,000-4,999
3. 500-999
4. 250-499
5. 100-249
6. 50-99
7. 20-49
8. 1-19

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▶ NCC-TELECOMMUNICATIONS '86

Users register rage, frustration in wake of special access rate hikes

BY MICHAEL FAHEY
Staff Writer

PHILADELPHIA — Users interviewed at the NCC-Telecommunications '86 show here last week are angry and frustrated by the rash of recently levied special access rate hikes.

But these communications managers told *Network World* they have few alternatives to the increasingly costly local portion of private lines.

The rate hikes, levied by local exchange carriers, have increased the cost of the local channel portion of private-line service in many areas of the nation. The local channel is supplied by the the local carrier, and it connects a user's premises with a long-distance carrier's point of presence.

"I'm very concerned about the increases in special access rates," said Dennis Travers, assistant vice-president of the communications division at First Pennsylvania Bank, based here. "The problem is trying to do something about it."

Local providers hold virtual monopoly

Travers said that, unlike long-distance service, where users have a choice of carriers, local exchange providers have a virtual monopoly, and users are forced to pay the higher local rates in order to access the more price-competitive, long-haul portion of their private lines. "I can't turn to MCI [Communications Corp.] or [US] Sprint [Communications Co.] for the local part of the service," Travers complained.

Gerry Heatherington, assistant vice-president of telecommunications for National Bank of Pittsburgh, said the rising cost of private-line service has prompted him to consider switched, rather than dedicated, service for some of the bank's locations.

"If there are locations where I can't justify private lines because of the increased costs, I may go to some form of switched service," Heatherington said.

But for a variety of reasons, other users said they are forced to continue employing private-line service.

Joseph Kraemer, a partner and analyst who follows the telecommunications industry for Touche Ross & Co., a Big Eight accounting firm, said the carriers' moves to increase special access charges in order to make the switched network more attractive would be an accepted method of influencing the marketplace in most industries.

Kraemer noted, however, that the local exchange carriers' tactics are much less acceptable in an industry accustomed to regulation.

The price hikes have affected nearly all users of private-line service, but for large users with many multidrop lines, the rate hikes are particularly costly.

Bard Haerland, director of worldwide telecommunications for Sperry Corp., said his company is very concerned about the special access charge increases. Haerland said tariffs have such an impact on his company's communications operations that Sperry has an employee devoting nearly all his time to monitoring tariff changes.

Unlike Haerland, whose network spans the globe, Rick Boaman, a communications analyst for Universal Electronic Service Corp., deals with a network located entirely in Pennsylvania. Boaman said his company, which supplies communications services for several banks in Pennsylvania, has seen its networking costs rise by 40% in the last year.

He said much of the increase can be attributed to Bell of Pennsylvania's rate hikes, including special access increases.

Current bypass solutions not adequate

Boaman said his firm has no choice but to continue paying for special access service from Bell of Pennsylvania to connect the network to its in-state long-distance carrier. He said current local exchange bypass technologies would not be an adequate solution to Universal Electronic Service's rising costs.

He said the company's network does not span enough territory to justify satellite service. Private cable bypass schemes are not favorably looked upon by banks, which require highly reliable and secure communications facilities, Boaman said.



"NETWORK WORLD HAS INDEED, IN JUST A FEW SHORT MONTHS, BECOME AN 'INDUSTRY STANDARD' AND A 'MUST READ' FOR END USERS IN THE TELECOMMUNICATIONS FIELD. CONGRATULATIONS!"

Prince I. Dyess
President
Tele-Communications Association

Prince I. Dyess is president of the Tele-Communications Association (TCA) and the Director of Telecommunications at the Scripps Clinic and Research Foundation in La Jolla, CA. TCA, based in West Covina, CA, is one of the largest regional user associations in the country. The 25-year-old association boasts more than 2,300 members and is growing at a rate of 15% per year. The organization has expanded its operation to include seven chapters located in five western states.

NETWORK WORLD

A PUBLICATION OF CW COMMUNICATIONS

The Weekly for Leading Users of Communications Products & Services
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171

▶SATELLITE TRANSMISSION

K mart, Chrysler extol satellite net virtues

BY BOB WALLACE
Senior Writer

LAS VEGAS, Nev. — Using the Satellite Communications Users Conference here as their podium, K mart Corp. and Chrysler Corp. last week showed other users how satellite technology is helping them cut communications costs and increase productivity.

K mart's very small aperture terminal net is designed to handle data communications between the company's Troy, Mich., data processing center and 2,000 company locations nationwide. Chrysler's satellite network supports one-way video transmission from the automaker's Detroit headquarters to some two dozen regional sales offices in the U.S.

In June, K mart inked pacts with both GTE Spacenet Corp. and GTE Telenet Communications Corp. totaling roughly $40 million. Under the agreement, GTE Spacenet will provide the retail chain with transponder space and Vsats manufactured by NEC America, Inc. GTE Telenet will provide packet assembler/dissasembler (PAD) equipment to be used in conjunction with the X.25-based satellite net.

Walter Bzdok, corporate communications and systems reliability senior director for K mart, said all K mart stores, regional offices and distribution centers will be linked to the Vsat net. In every K mart location, a variety of computing equipment will be linked through a PAD to a NEC Vsat, he said. Among the processors at each store will be an IBM Series/1 minicomputer, an IBM Personal Computer AT or an NCR Corp. point-of-sale controller, a pharmacy microcomputer and a micro handling the building's energy management system.

One key Vsat network application will enable K mart to handle credit card authorizations quickly from its retail outlets. A pilot test comprising 50 Vsats located in both the Detroit and Tampa/St. Petersburg, Fla., areas is scheduled to begin in November, Bzdok noted.

NEC will also construct for K mart a network control center, to be based in Detroit, that will allow K mart staffers to monitor and manage the mammoth satellite network. GTE Telenet has developed software for the control center that will monitor operation of the PAD equipment in each network location. NEC will provide software that will enable K mart to monitor the operation of the 2,000 Vsats.

When K mart originally distributed its network request for proposal (RFP), few companies offered Vsat hardware, Bzdok recalled. The company was looking for a terrestrial network that would tie together the multitude of K mart locations using X.25 technology. "The thought of installing and managing a 2,000-leased line network was scary," he related. After submitting the RFP to Vsat service providers, Bzdok found himself sifting through 5,000 pages of technical material he received from a handful of Vsat system vendors.

K mart solicited the services of a communications consultant to review the RFPs. It finally signed a 700-page contract with GTE Spacenet/GTE Telenet.

Bzdok said K mart rated the need for disaster recovery facilities high on the network features list. "If a disaster wiped out our data center in Troy, all incoming transaction processing data from the company's retail outlets would be redirected to an emergency data center, located 50 miles away from Troy, that K mart leases from a subsidiary of Blue Cross/Blue Shield of Michigan."

In such a scenario, K mart's retail sites would not be able to perform credit card authorizations, but they could transmit transaction data to the backup data center over GTE Telenet's public data network.

Chrysler's satellite network, established shortly after the automaker's brush with bankruptcy in 1983, is used to deliver live employee training programs and corporate messages to zone headquarters, each of which is outfitted with a five-meter, C-band satellite dish manufactured by M/A-Com, Inc.

Peter Hollinshead, Chrysler Satellite Network manager, said many of the programs sent out over the network are produced at WDIV-TV in Detroit. "The cost of duplicating the telecast production facilities this television station has would cost our company several million dollars," he noted.

The telecasts are sent over a microwave link to the North Comm Teleport located just outside Detroit. From there, the signals are sent up from the teleport's satellite uplink to a transponder on Western Union Corp.'s Westar IV communications satellite. Finally, the video signal is beamed down to the network's 24 receiving locations.

"The savings realized by eliminating travel costs associated with training Chrysler employees was not a good enough reason by itself to justify the creation of the network," Hollinshead claimed. "But you can't put a price on the amount of time at the office that is lost by those who would have to fly to Detroit for training courses."

Hollinshead said all telecasts sent over the Chrysler Satellite Network are encrypted. "Although encrypting the signals sometimes seems to be more trouble than it's worth, we need to have this capability," he stated. "If we were announcing a new car purchase incentive program to our zone headquarters personnel, we would not want the signal intercepted."

▶VSAT NETS

Southland reselling capacity

Deal with M/A-Com boosts service role.

BY BOB WALLACE
Senior Writer

LAS VEGAS, Nev. — Southland Corp., the first user to resell capacity on its corporate two-way, very small aperture terminal network, last week contracted with M/A-Com Telecommunications, Inc. to purchase 1,200 Vsats, which it will supply to other users.

At the Satellite Communications Users Conference here, representatives of Southland's communications subsidiary, Sharenet Corp., discussed the M/A-Com contract, through which Sharenet will sell Vsats to users that purchase excess capacity on Southland's hub, or master earth station.

Sharenet manages Southland's 300-site, two-way Vsat net, which connects Southland's district offices with its headquarters in Dallas.

The value of the contract was not disclosed.

An alternative to private networks

Sharenet is hoping to sell users with low-volume communications needs on the idea of leasing capacity on Southland's net as an alternative to purchasing a private communications network.

The Vsat net resale option may prove attractive to medium-sized companies interested in replacing portions of their communications nets comprising local or long-distance leased lines.

Unlike most users who have opted to lease capacity on shared hub stations owned by satellite services vendors, Southland chose to purchase a dedicated hub station for its communications network. M/A-Com is currently constructing Southland's Vsat network hub.

Hub stations are commonly located near the Vsat net user's corporate headquarters or main data processing center.

Data is sent from the hub to the communications satellite, which in turn beams the data to all remote Vsat sites.

The remote Vsat locations may also send data to the satellite, which in turn beams the data to the hub station.

M/A-Com's Personal Earth Station, available in 1.2-meter or 1.8-meter versions, can support aggregate data speeds of 512K bit/sec, for hub to remote Vsat, and 128K bit/sec, for remote Vsat to hub. This bandwidth can be assigned in increments from 1,200 bit/sec to 56K bit/sec for synchronous traffic and up to 9.6K bit/sec for asynchronous data traffic.

Intelsat from **page 2**

said. He said Intelsat is also considering Arianespace's 4, the Soviet Union's Proton and the Japanese H2 rockets as a means of lifting Intelsat satellites into orbit.

Intelsat is laboring to expand the capabilities of its VI Series of satellites while the organization waits to augment its fleet of 16 operations satellites. "Out of every disaster, you can find a golden opportunity to do something positive," Colino commented. The Series VI satellites have been modified to handle either 120,000 voice circuits or 200 television channels. Either capability represents an available throughput of five billion bit/sec, he noted.

Intelsat has already begun to modify all five of the Series VI communications satellites. The birds, which will be more powerful and capable of covering larger geographic areas than its predecessors, are expected to have 14-year lifetimes, Colino noted.

T-1 from **page 1**

Second, users would like to incorporate all network management information under a central network management package, according to W. Chuck Kanupke, vice-president at Dataquest, Inc.'s Marlton, N.J., office. Currently, most network management packages function autonomously.

IBM is attempting to make Netview the umbrella that controls all network equipment. The first step in this process was integrating autonomous IBM network management products such as Network Communications Control Facility and Network Problem Determination Application, a capability that is expected to be a key selling point when production shipments of Netview begin later this year.

The second step is pulling other vendor's offerings under the Netview aegis. A month before Netview was announced, IBM published its network management specifications for the first time. This move enabled vendors to begin developing interfaces from their products to IBM network management offerings.

In addition to the T-1 manufacturers, other vendors, such as modem manufacturers and performance monitor suppliers, are attempting to weave their products' network management information into the Netview tapestry.

Analysts speculated that T-1 network management information will not be transmitted over a T-1 line. Instead, information will sent from an RS-232 port on the T-1 network management device to an IBM device, which will feed the information to Netview.

"Most T-1 manufacturers' net management systems have an RS-232 port, which often is connected to a printer," noted Gerald F. Mayfield, vice-president at the DMW Group, Inc., a Stamford, Conn., consulting firm. "It would be easy for them to use that port to send their information into Netview."

▶LOCAL NETS

3Com to serve up server, price cuts

Firm also to debut 3+ enhancements, new software products.

BY JIM BROWN
New Products Editor

MOUNTAIN VIEW, Calif. — 3Com Corp. is expected to unveil today a dedicated file server, enhancements and additions to its 3+ network operating system software. It is also expected to announce price cuts for its Ethernet and Token-Ring Network adapter cards.

The firm is slated to introduce the 3Server3 dedicated file server that company officials say boasts faster performance than the company's older 3Server. Reportedly designed to take advantage of 3Com's 3+ operating system, the 3Server3 boasts up to 910M bytes of storage when fully configured and supports Ethernet and Apple Computer, Inc.'s Appletalk networks. However, only networks driven by 3Com's Etherseries network operating system will support Appletalk networks. An expansion board supporting IBM's Token-Ring Network can be added to the unit.

The base unit, priced at $7,495, is equipped with a mother board containing an Intel Corp. 80186 microprocessor with 1M byte of dual-ported random-access memory (RAM) and Ethernet and Appletalk connectors. The base unit also has an Intel 82586 network coprocessor, a 70M-byte hard disk, one parallel port and one serial port. An additional 2M bytes of RAM can be added by installing a $1,495 3Com Cache Card, which stores frequently used operation information and keeps a cache of directory and file allocation tables.

Overall system storage can be increased in increments of 70M bytes and requires purchase of a $4,995 disk drive expansion unit. The expansion unit contains a small computer systems interface, a 70M-byte disk and space for an additional 70M-byte disk, which can be purchased for $2,995.

The firm also announced additions to the 3+ software line: 3+Netconnect, 3+Start and 3+Turboshare.

The $1,250 3+Netconnect package links separate Ethernet and Token-Ring networks. It also links multiple Ethernet or multiple Token-Ring Networks. The $295 3+Start package supports logon to the server from a personal computer equipped with a 3Com Etherstart programmable read-only memory board.

The 3+Turboshare package implements the jointly developed Lotus Development Corp., Intel Corp. and Microsoft Corp. expanded memory specifications to manage access to data and disk caches in the 2M-byte extended memory from the server's 1M byte of main memory.

The package is included with 3Com's CacheCard or can be purchased for $295 to support memory expansion boards from other vendors.

The 3+ network operating system was enhanced to support both IBM and 3Com Token-Ring adapter cards.

Also added to the 3+ operating system was a window-based, menu-driven network installation and configuration facility.

The basic 3+ operating system will now be priced on a per-server basis, the firm said. A package supporting the first five users is priced at $895. A package supporting five or more users is $1,790.

3Com also dropped the price of its Ethernet adapter from $650 to $595 and its Etherlink Plus from $1,095 to $895. The firm is expected to reduce the price of its Token-Ring adapter next year.

▶NORTHERN TELECOM

Control tool for remote PBXs slated for debut

BY JOHN DIX
Senior Editor

Northern Telecom, Inc. is scheduled to announce today a network management system that will enable customers to monitor and control remote SL-1 private branch exchanges as if they were housed locally.

The device, called the NM-1, will address many of the problems that make management of multiple switches an onerous task — including the need to perform moves and changes from a central point — but will initially lack a few much-needed features, such as the ability to gather call detail reports from remote PBXs.

Based on Northern Telecom's DV-1 switch/processor, the NM-1 will provide real-time monitoring and control of up to 15 remote SL-1s, according to Mike Brady, director of network management systems.

The system works in conjunction with intelligent, random-access memory-based devices that are installed at the remote switch sites. These data capture devices have built-in modems and are periodically polled by the central NM-1.

"These devices filter out problems that you deem critical to the management of your network," Brady said.

"You don't flood the management center with lots of details, only information considered important to the operation of your network."

Alarm conditions, determined by customer-defined thresholds, are graphically represented on a color terminal. Switch problems, such as failed line and trunk cards, trunk failures, switch initialization problems and processor failures, are depicted on the terminal and recorded by the NM-1 for later study.

An automatic trouble ticket system enables customers to capture events and track them through to resolution, Brady said.

In practice, "the NM-1 will enable customers to gather critical data on the network and capture it in a form that can be managed," Brady explained.

"Through the DV-1 processing capabilities, the NM-1 will also enable you to gain access to run any built-in diagnostics on the remote PBXs or perform any moves and changes from the central site."

Product to be enhanced in the coming year

Next year, the product will be enhanced to enable customers to gather call detail reports from remote switches, but the system will not be capable of running call-accounting software.

Call detail data will be uploaded through remote job entry links to the processor the customer uses to run his call-accounting software.

Future enhancements will also make it possible to perform traffic measurements around the network to create performance reports for use in network optimization, Brady said.

Integration with other types of transmission test equipment would expand these capabilities.

Northern Telecom also anticipates that the NM-1 would make it possible to update remote PBXs across the network.

Pricing for the NM-1 has not been finalized, Brady said. The product is expected to be commercially available beginning in the first quarter of next year.

▶TELECOM POLICY

Senate hears Dole bill

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Members of the U.S. Senate Commerce Committee last week were divided not only over the scope of Sen. Robert Dole's (R-Kan.) proposed Telecommunications Policy Act of 1986, but whether the bill stands a chance of being passed before the end of this Congress.

Representatives from the Departments of Commerce and Justice and the Federal Communications Commission testified at a Commerce Committee hearing last week on the bill, which would transfer authority over the Modified Final Judgment to the FCC from the Department of Justice and U.S. District Court Judge Harold Greene.

Only seven members of the 17-member Commerce Committee bothered to show up for the hearing, indicating a general lack of interest in the telecommunications legislation. Nonetheless, the hearing room was packed with a standing-room-only crowd of telecommunications industry lobbyists.

Controversy surrounding the Dole bill centers on whether the FCC would give the Bell operating companies carte blanche to enter new business areas from which they are currently restricted. Most of the hearing participants agreed that the federal district court is not the arm of federal government that should be deciding telecommunications policy.

They also agreed that the FCC and the Congress should work together to determine how the telecommunications industry should be regulated in the future.

Disagreement centers on interpretation of the bill. Dole said, "Senate 2565 simply consolidates in the FCC all federal telecommunications policy, including the AT&T and GTE consent decrees, which have governed the industry since 1982. This is a simple procedural bill that does not address issues such as allowing the BOCs to participate in the field of equipment manufacturing, interexchange service [and information services]."

Commerce Committee Chairman John Danforth (R-Mo.) disagreed, emphasizing the potential threat of unbridled deregulation. Danforth expressed reservations about the FCC. "Our concern is that if Congress doesn't give specific direction and guidelines to the FCC, then the FCC becomes a law unto itself," Danforth said.

While defending the FCC's record in cracking down on competitive abuses, Fowler said congressional guidelines covering ratepayer protection, trade concerns and international competition would be welcomed by the FCC. "We do not believe we are anything but a creature of Congress," Fowler said.

Those testifying in favor of the bill's prompt passage included Fowler; Douglas Ginsburg, assistant attorney general for antitrust; and Alfred Sikes, assistant secretary of the Commerce Department's National Telecommunications and Information Administration.

Those opposing the bill include AT&T, MCI Communications Corp., the Consumer Federation of America and users groups.

▶SETA CONFERENCE

Users seek solutions

BY MARGIE SEMILOF
Senior Writer

NASHVILLE — Communications managers attending the Southeastern Telecommunications Association's (Seta) annual conference here last week said they are more concerned with finding solutions for immediate networking needs than with building integrated voice and data networks.

Many of those managers, who numbered more than 250, said they attended the conference to seek assurance that they are not alone in their postdivestiture confusion.

Seta is an umbrella organization comprising eight regional users groups from Southern states. According to Seta President Sam McGuire, show attendance increased by 33% over last year, an indication that users have plenty of company in their searches for network solutions.

The theme of the annual meeting, "Planning for Network Integration," was sounded in a keynote speech by John Clendenin, chairman and chief executive officer of BellSouth Corp. Clendenin urged users to press for Integrated Services Digital Network services.

Although some users claimed to be integrating voice and data over services such as T-1, they said the practice was costly and the technology was not as advanced as some vendors claim.

Users also said most of their planning efforts were directed at more mundane issues, such as cost control, selling new ideas to upper management, finding and keeping quality communications personnel and finding new networking solutions for specific applications.

Several users said that as long as their networks were functioning properly and costs remained under control, they see no reason to alter the practice of running voice and data applications separately.

Alba Shumate, telecommunications manager for Miami-based Southeast Bank, observed that running voice and data traffic together in smaller networks may hold fewer risks than mixing both services over a larger network.

"We have dedicated circuits running throughout the state," she said. "Our network is pretty clean. We may consider multiplexing some data through our [private branch exchange]. At this point, however, I'm not sure that if we did mix voice and data, it wouldn't mess things up."

Carlisle Reames, telecommunications manager for Bankers Trust of South Carolina and a member of Seta's planning committee, said many users expressed an interest in learning about multiplexing technology and PBXs.

"There also seems to be a swing back to concern about quality," Reames observed. "People are willing to pay more and install fiber in their networks for clearer transmission."

Arthur Allen, manager of telecommunications for Charlotte, N.C.-based Coca Cola Bottling Co., said he is planning to link about 40 sites throughout the Southeast. Allen currently manages data traffic via dedicated circuits and uses a mix of Northern Telecom, Inc. SL1 and AT&T System 75 PBXs for voice.

"We are considering using satellite services for our data network," Allen said. "That is not the best medium for voice traffic, although eventually we may try it for some voice applications.

"Right now, our biggest considerations are: Will it work? Can we cap our costs in five years? and Will satellite service affect our response time?" he added.

Studying the available methods and costs involved in using a PBX to back up existing Centrex services was one concern of Elva McLean, telecommunications manager at E.I. Dupont in Richmond, Va. She said that studying management of network income expense and services is at least one of the steps she would take to sell some of her voice networking ideas to management.

"You don't get anywhere until you can do that," she said.

One well-attended session focused on management of network income, expenses and services. According to Marshall Roberts, president of Stonehouse & Co., a Dallas-based software and consulting firm, "Companies are just now beginning to formulate a policy on how to do internal costing.

"Companies are no longer viewing telecommunications as a cost for doing business," he said. "They are more interested in making a profit."

▶IBM

Rome OSI lab added

Facility joins Big Blue's U.S., French centers for OSI software development.

BY JIM BROWN
New Products Editor

PARIS — IBM said late last week it will open in Rome its third Open Systems Interconnect (OSI) development center.

The center will focus on development of telecommunications software, for use with IBM systems, that supports the International Standards Organization's (ISO) seven-layer OSI interconnect model.

IBM has other OSI development centers in La Gaude, France, and Palo Alto, Calif. The La Gaude center concentrates on developing software tools supporting the first three layers of the OSI model, which include the physical link, data link and networking layers.

The Rome development center will augment the Palo Alto center's development of software supporting Layers 4 through 7 of the OSI model, which include the transport, session, presentation and application layers.

The upper layers of the OSI model reportedly will allow different systems to interact over a standardized network, regardless of operating systems.

Much of IBM's OSI development work has taken place in Europe, where the computing community has in large measure shunned Big Blue's proprietary Systems Network Architecture. SNA is the basis of IBM networks in the vast majority of major U.S. businesses.

IBM announced last September its Open Systems Transport and Session Support software package, which it says was one of the first packages to support OSI Layers 4 and 5.

That product was developed in IBM's Program Product Development Center in Sindelfingen, Germany.

IBM also introduced products last year that support Manufacturing Automation Protocol Release 2.1, the closest implementation of the OSI model in the U.S.

Those products were developed at the Palo Alto center.

Overcharges from **page 1**

est business users in the nation. The report comes in the wake of an April study released by the U.S. General Services Administration and the U.S. Army, which charged that the telephone companies were earning an excessive rate of return on equity, and called on state regulatory agencies to order rate reductions.

The CFA report said the Bell operating companies' profit rates are one-third higher than the average for the largest U.S. companies.

It went on to say that the local telephone companies, which generate most of their revenue from the provision of monopoly telephone services, enjoyed a 14.1 % return on investment during the first half of 1986. During the same period, the nation's 900 largest companies earned an average rate of return of 10.6%. The average rate of return for other utilities was 10.8%, according to the report.

"The local phone companies received preferential treatment after the AT&T breakup because of the uncertainty of the postdivestiture market," said Mark Cooper, the CFA offical who authored the report. "It turned out the concerns about what would happen to the Bell companies after AT&T cut them loose were unwarranted."

The study claimed:

- Regulatory bodies granted the Bell companies approval for telephone rates that brought them excessive return on equity and cost business and residential customers between $1.25 billion and $2 billion.
- Accelerated depreciation of equipment used for in-state services contributed to $1 billion in customer overcharges.
- Unjustified debt expenses accounted for overcharges of between $200 million and $400 million.
- Residential and business users of local phone services financed a 1985 return on equity, which increased, while the rate of return for other utilities and major corporations declined.

Brian Moir, an attorney for the ICA, said ICA representatives joined the CFA during the press conference in which the report was made public, because the users group supports the report's findings. Moir said the alliance of big users and a consumer organization representing residential users would make it difficult for state utility regulators to ignore the need to reexamine and lower telephone rates.

Representatives of the Bell operating companies were quick to contest the report's conclusions.

In a prepared statement, a Nynex spokesman said, "The CFA has alleged on other occasions that high rates of return result in overcharges to customers; therefore, the conclusion of this particular study is not surprising. Nynex as well as regulators at both the federal and state level disagree with the CFA."

The statement claimed Nynex's growth in profits is based on many factors not addressed in the CFA study.

"Those include the strength of our management, a robust economy in the northeastern part of the United States and increased use of our telephone companies' networks," according to the report.

William Hensley, public relations director for Ameritech, denied the CFA charges.

"We see no basis for the requested reductions," he said.

"We are earning fair profit for the quality of service we provide."

According to Hensley, Ameritech's residential rates have increased less than 3% since divestiture and Ameritech's business rates have increased less than 5%.

Cooper replied by saying, "That response from the phone companies is exactly the kind of mentality we are fighting.

"It's not just a question of rates rising or falling, but a question of fairness. In this case costs are falling and rates should be falling also."

Calendar

Sept. 16, Fairfield, N.J. — Understanding Local-Area Networks and Computer Connectivity Issues. Contact: Applitek Corp., 107 Audubon Road, Wakefield, Mass. 01880.

Sept. 16-17, San Diego — Hands-On PC Networks. Also, Sept. 23-24, Washington, D.C.; Oct. 21-22, Boston; Nov. 4-5, Palo Alto, Calif.; Nov. 18-19, Washington, D.C. Contact: Yolande Amundson, Integrated Computer Systems, 5800 Hannum Ave., P.O. Box 3614, Culver City, Calif. 90231.

Sept. 16-18, Dallas — Networld '86. Contact: Infomart, Suite 6038, 1950 Stemmons Freeway, Dallas, Texas. 75207.

Sept. 17-18, New York — Financial Analysis for Telecommunications Equipment Acquisition. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Sept. 17-19, Arlington, Va. — Bypass Networking with Small Satellite Terminals. Also, Nov. 19-21, San Francisco. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Sept. 17-19, Washington, D.C. — Local-Area Data Communications Networks. Contact: The George Washington University School of Engineering and Applied Science, Washington, D.C. 20052.

Sept. 18-19, Washington, D.C. — T-1 Networking and Bypass. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Sept. 18-19, Toronto — 4th and 5th Generation Data Management Software. Also, Oct. 9-10, Calgary, Alta.; Nov. 6-7, Washington, D.C. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

Sept. 22-23, New York — Telecom System Maintenance: Management and Cost Control. Also, Oct. 27-28, Chicago; Nov. 3-4, Los Angeles. Contact: BCR Enterprises, Inc., 950 York Road, Hinsdale, Ill. 60521.

Sept. 22-24, Natick, Mass. — Effective Analysis and Design of Information Systems. Also, Nov. 19-21, Worcester, Mass. Contact: Kathy Shaw, Office of Continuing Education, Worcester Polytechnic Institute, Worcester, Mass. 01609.

Sept. 22-24, Los Angeles — Vsam for the Programmer/Analyst. Contact: Bill Van Haeren, Computer Assistance, Inc., Suite 211, 12100 East Imperial Highway, Norwalk, Calif. 90650.

Sept. 23-24, Washington, D.C. — The Future of Centrex: Centrex in the New Computer III Environment. Contact: Rose Hill, Conference Registrar, Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

Sept. 23-26, Washington, D.C. — Computer Network Design & Protocols. Also, Sept. 30-Oct. 1, San Diego; Nov. 4-7, Los Angeles; Nov. 18-21, Boston; Dec. 2-5, Washington, D.C. Contact: Yolande Amundson, Integrated Computer Systems, 5800 Hannum Ave., P.O. Box 3614, Culver City, Calif. 90231.

Sept. 24-25, Chicago — Introduction to Fiber-optic Communications Systems. Also, Oct. 8-9, New Orleans. Contact: Hinckley Communications, Inc., 14 Parker Road, Osterville, Mass. 02655.

Sept. 24-26, Cleveland — Data Communications. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Sept. 25-26, La Jolla, Calif. — Third Annual Intelligent Buildings Conference. Contact: Cross Information Company, Canyon Center, Suite 311, 1881 Ninth St., Boulder, Colo. 80302.

Sept. 25-27, San Francisco — Fourth Annual Personal Computer Fair. Contact: The Interface Group, Registration Department, 300 First Ave., Needham, Mass. 02194.

Sept. 28-Oct. 2, Dallas — Society for Information Management's Annual Conference. Contact: Society for Information Management, Suite 600, 111 E. Wacker Dr., Chicago, Ill. 60601.

Sept. 29-30, San Francisco — Satellite Technology for the Nontechnical Manager. Also, Nov. 13-14, Washington, D.C. Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

Oct. 1, Hartford, Conn. — Dealing with Vendors and Suppliers. Also, Oct. 7, Boston. Contact: Performance Seminar Group, 11 Commerce St., Norwalk, Conn. 06850.

Oct. 1-3, Dallas — Principles and Applications of Fiber-optic Communications Systems. Also, Nov. 5-7, Denver. Contact: Lightech, Inc., Suite 515, 2116 E. Arapaho, Richardson, Texas. 75081.

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HORRELLSCOPES

BY EDWARD HORRELL

In communications today, it takes more than just good business sense to survive; it requires celestial guidance.



Gemini: The sign of patience, Gemini, is hanging over Centrex, the old faithful that's making a comeback.

Tolerance is the Gemini watchword . . . and what has tolerated more than Centrex?

The Bell operating companies are making a strong effort to revive Centrex. The system was down during the late 1970s — down, but not out.

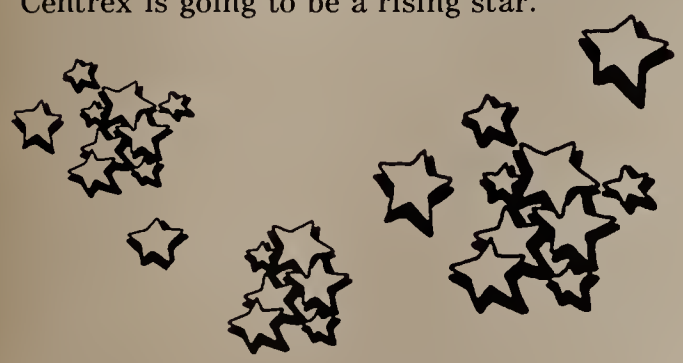
Now, promotions and repackaging efforts are rewarding the patience of the faithful Centrex followers.

Users of all sizes that are considering changing their private branch exchanges should think about Centrex. Instead of the ugly caterpillar, Centrex has blossomed into a beautiful butterfly, especially beautiful when compared with some of the recent introductions of wormy new systems.

Among other advantages, Centrex offers the following stellar qualities:

- Eliminates floor space worries.
- Reduces backup power worries.
- Houses the switching gear at the central office.
- Offers fast maintenance.

With the upcoming freedom of BOCs to provide network services and equipment, Centrex is going to be a rising star.



Cosmic catastrophe of the month.

Rolm Corp., the company that gave meaning to the words digital switches and the firm that inspired users to utter "class act," has now redefined the word "tacky."

The new Rolm "chance to enhance" promotional campaign features a video that portrays the Statue of Liberty as a Mae West-type who says, "Is that a telephone in your pocket or are you just glad to see me?"

The public is used to clever advertising from telecommunications companies. US Sprint Communications Co., AT&T and MCI Communications Corp., to name a few, have set high standards for classy advertising.

One can only hope that the people who thought up that tripe for Rolm are taking a long rest on the distant planet from which they no doubt came.

Horrell is president of Mitchell & Horrell, Inc. in Memphis, Tenn.



Aries: The sign of those with vision and innovation governs users who like to get it on paper.

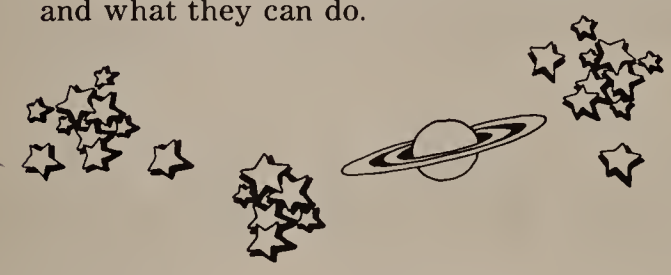
Having a written plan for telecommunications systems is vital these days.

With all the new services now in the universe and all those being developed, users are having a tough time sorting through what they need vs. what vendors would like them to think they need.

It's very much a telecommunications cosmos where solutions outnumber the problems. Wise users will organize their offense. And any good offense starts with a written plan.

This plan for conquering space and time should cover where the users are, where they're going and how they plan to get there. When users look at their plan, some vendors will be more attractive to them than others. This will put the smart user in the pilot's chair when dealing with vendors.

When plotting a course for worlds unknown, keep these tips in mind: Formulate concise, measurable and realistic assumptions. Don't limit your imagination when defining the opportunities that may pop onto the horizon. Accurately assess your internal organization — know who your people are and what they can do.



Shooting stars.

Watch Intecom, Inc., now a part of Wang Laboratories, Inc., get tough with the BOCs at the end of their contracts in 1987.

Intecom wants the BOCs to quote its product as top of the line. Because Wang does not like distribution by both BOCs and a direct sales force, upcoming clashes will be worth watching.



Look for management changes. The same managers will be handling both the BOCs and the direct side . . . until contract time. That's when Wang will give the BOCs a choice — push Intecom or become a competitor against a stronger direct Intecom sales force.

The relationship among Intecom, Wang and Telenova, Inc. also bears watching. The marriage of the Telenova PBX and Wang equipment is as good a match as any in the industry. Where will that leave Intecom, that old IBM-compatible player?



Pisces: Users are warned not to be left swimming around in a sea of promises.

Typically, PBX vendors write contracts to their benefit. And most of the time, payment terms call for the entire sales price to be paid at the time installation is complete. This is nonsense.

The time to pay the final installment of the contract is when the user is satisfied that the job is done right and the system performs as promised.

One major company bought a large system, and the vendor requested a 25% down payment. The customer agreed, but withheld 65% until he accepted the system, not at the completion of the cutover, but only when the system had performed as agreed.

The vendor had trouble with sets in the factory and didn't get the balance for eight months. Under a normal purchase agreement, the vendor would have been completely paid, leaving little incentive to make sure the entire system worked.

Users should insist on holding a percentage of the total price — 10% to 15% is usually enough — until the system performs as the vendor said it would.

If the vendor refuses, take the program somewhere else.



Sagittarius: Blessed with high and noble aspirations, most Sagittarians know how to take aim and hit the mark.

The toughest mark to hit these days is an accurate growth prediction for PBX systems. Without question, the most common mistake made by new PBX customers is buying systems that are too small.

Prospective PBX users will find that vendor sizes come in different flavors: single-cabinet systems, multiple-cabinet modular systems, distributed architectures and so on. In any case, there is a definite and definable maximum size that can be acquired.

In developing the request for proposal, users should consider the maximum traffic-carrying capability of the system. In addition, users should determine the growth capability of the system before the processor must be changed or an additional cabinet must be purchased.

Users should provide the vendors with the desired maximum capacity. Accordingly, the request for proposal should ask for the maximum capacity as quoted by the vendor. If this figure is below the desired figure, a potential problem exists.

When estimating growth, remember the following rules:

- Estimate growth higher than probability.
- Be prepared to be low.
- Inflate the earlier estimate.
- Still be prepared to be low.



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